


Focal Handbooks

David E. Elkins	<i>Camera Terms and Concepts</i>
Steven E. Browne	<i>Film \rightleftharpoons Video Terms and Concepts</i>
Arthur Schneider	<i>Electronic Post-Production Terms and Concepts</i>
Richard K. Ferncase	<i>Film and Video Lighting Terms and Concepts</i>


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For
Jeanne Kendrick Ferncase

Preface

Dear Reader:

The motion picture and television industries have long enjoyed a colorful and expanding vernacular of terms for the many instruments, accessories, apparati, personnel, and techniques used in those professions. Some terms have been replaced by more politically and technically correct names; for instance, the gaffer's key assistant is now officially known as the *second electric*, but the older and clearly outmoded term *best boy* persists in everyday usage, perhaps for its colorful associations, its easy pronunciation, or simply out of nostalgia for the studio days of yore. Other terms have given way to more accurate descriptions: e.g., the designation *ASA* (for American Standards Association, a defunct organization that lent its name to a system for rating a film's light sensitivity) continues to find usage among older professionals, even though the proper term today is *EI*, for *exposure index*.

Although many terms are generally accepted and commonly used by technicians everywhere, a good many idioms also flourish in different geographical areas and may not be widely known. The British lighting director, for example, may not know that in Hollywood, "beaching a stand" means securing a light stand with a sandbag. The lingo of production people may sound quite foreign and cryptic to the novice, or even to the seasoned professional who is unaccustomed to a certain region. One gaffer's *Mickey* is another's *redhead*. Having said that, I must point out that the bias of this reference book is toward the terminology used in and around Los Angeles, California, still the motion picture capital of the world.

I have tried to include as many terms as possible in this volume. It's difficult to come up with anything truly original—and I haven't. What I have done is interviewed grips, electricians, and cinematographers, and pored over most every tome I could find remotely related to film and television production to aid me in assembling a real-life lexicon of lighting jargon that both the student and the professional are likely to hear (and puzzle over) in the field. Since that jargon evolved and transmogrified even as I wrote, I hope that this volume will stay current long

enough to be a unique and useful contribution to the burgeoning body of literature devoted to this field.

I would like to thank the staff of Focal Press—especially Karen Speerstra, Valerie Cimino, and Sharon Falter—for their patience and assistance during the writing of this volume. I thank Paul Frizler, who selflessly stood by me during a particularly stressful period in my career. I also thank Ron Thronson and my colleagues at Chapman University, including Bob Bassett, Jay Boylan, and Greg Hobson, for their support.

I would also like to acknowledge the Mole Richardson Company, Matthews Studio Equipment, Inc., and Lowel Lighting, Inc., for their assistance.

Most of all, I would like to express my deepest gratitude to my mother, Jeanne.



Abbie Singer shot In film production, the next-to-last shot of the day. The shot is supposedly named after an *assistant director* who worked for Universal Studios during the 1950s, who would tell the crew that they were to shoot the current shot plus one more before moving to a different part of the *studio*. The final shot of the day is popularly referred to as the *martini shot*.

absorption The phenomenon that occurs when light strikes a surface or passes through a medium and is transformed into another form of energy, generally heat. Dark colors and *values* tend to absorb more light than light colors. The opposite of absorption is *reflection*.

ac See *alternating current*.

accent light An instrument placed in such a way as to emphasize a particular subject. Generally a *key light*, *kicker*, or *backlight*.

acceptance angle The area of view that falls within the sight lines of a lens or photosensitive cell. The acceptance angle is defined by two imaginary lines, one drawn from each extremity of the field of view to the borders of the image received by the lens or cell. A long or telephoto lens has a narrower angle of acceptance than does a short lens.

ace A 1,000 *watt* fixture, also known as a 1K, or *baby*.

acetate A clear sheet plastic composed of cellulose triacetate, used as a base for motion picture film and *filter gels*. Acetate has superseded the older cellulose nitrate base, which was highly flammable and unstable.

actinic The property of radiation to cause chemical change. In cinematography, the proportion of the *white light* spectrum that is

Terms that are defined elsewhere in the book are italicized the first time they appear within an entry.

actually recorded on the *emulsion* of a film. For example, cool *daylight* has a higher actiniccy on blue-sensitive panchromatic film than does warm *tungsten* light.

action The vital point of attention within each frame, which can be an actor or actors, inanimate objects, or other featured subjects.

action axis See *imaginary line*.

action car An automobile or truck in which actors ride as part of a scene, during a moving car shot.

acutance In a film image, the degree of *density* change at the edge of a subject from the weakly to the strongly exposed areas. Acutance is measured with a *densitometer*, which gives an accurate measurement of an image's sharpness.

AD See *assistant director*.

additive primary colors The colors red, green, and blue; when added together they combine to form *white light*. See also *additive process*.

additive process A system of color photography that adds together lights of the three *additive primary colors*—red, green, and blue—in different degrees to form an image. The “seven colors of the rainbow” notwithstanding, for photographic and technical purposes it is now standard practice to consider *white light* in terms of its three additive primary colors. The secondary, or *subtractive primary*, colors are *magenta* (red + blue), *cyan* (green + blue), and *yellow* (green + red). The additive process is no longer used in cinematography, although a form of it is still employed in video imaging.

aerial perspective Also known as *atmospheric perspective*. An optical phenomenon that makes distant objects and colors appear less distinct and increasingly desaturated, due to layers of haze, smoke, or water vapor in the atmosphere between the eye or lens and the subject. The *density* of the atmosphere increases as the distance widens between viewer and subject. Compare *linear perspective*.

aerial shot A shot taken from an airplane or helicopter.

aerosol diffusion An aerosol spray used to create a fog or smoke effect.

age, to (verb) To give a fabric or surface a weathered or antique appearance by means of adding textures or appliques. For instance, draperies and costumes are often aged by soaking or spraying them with solutions of weak tea.

aircraft landing lights Small *PAR lamps*, including the PAR 48 and PAR 36, that are available in lower voltages than the standard PAR 64.

albedo The ratio of *incident light* to *reflected light*; the fraction of the light hitting a surface that the surface will reflect back.

alligator clip A small metallic spring-loaded clamp, similar in operation to a clothespin. The name derives from the pointed teeth featured on the jaws of the clip. Alligator clips are often used for making temporary electrical connections.

all-purpose filter A camera *filter* that does not alter *color balance*, such as a neutral *density* or polarizing filter.

alternating current (ac) Electrical *current* that reverses directional flow at regular intervals. In the U.S., electrical current supplied by power companies alternates at a rate of 60 *Hertz* (Hz), or cycles per second. The ac standard for Europe and the U.K. is 50 Hertz.

ambient light Naturally occurring *available light*.

American Society of Cinematographers A select organization of professional film and television *directors of photography*. The ASC publishes the *American Cinematographer's Manual*, a professional cinematography handbook, and the monthly periodical *American Cinematographer*. Membership to the organization is by invitation only and allows members to use the initials ASC after their names.

ammeter An instrument used for measuring electrical *current* in *amperes*. Also called an Amprobe (after a manufacturer of these devices).

ampacity The capacity of cable and distribution equipment to carry electrical loads without overheating.

amperage Volume of electrical *current* flowing through a *circuit*. Also refers to the electrical current draw of a given piece of lighting equipment.

ampere, or amp A basic unit of electrical *current*. Amps = *watts/volts*.

angle of acceptance See *acceptance angle*.

angle of incidence The angle between light rays from a light source and the plane of the subject that is illuminated. The angle of incidence is equal to the angle of *reflectance*.

angle on A screenplay direction denoting a change in camera angle.

ANSI code A coded three-letter designation named for the American National Standards Institute, used to classify *lamps* and *globes*. The

ANSI code, which determines basic bulb wattage configuration and socket type, is a standard used by manufacturers to ensure that any given lamps and sockets are interchangeable. See Table 1.

answer print The first print of an edited film from a film laboratory that includes a synchronized soundtrack and picture with color-corrected scenes. This print “answers” the expectations of the director and/or production company, and it often is the basis for further corrections in a second or third answer print. Also called *trial print*.

anticipatory setup A camera setup that focuses on a *prop* or scene and so sets the direction of the *action*.

antihalation backing or coating A black *opaque* coating on the base side of *film stock* that absorbs light penetrating the *emulsion* layer. The antihalation layer prevents light from passing through and reflecting back from the camera pressure plate and eliminates *halo effects* from *highlight* areas.

aperture The adjustable opening of a camera *iris* that passes light in controlled *intensities*. The size of a given aperture determines its *f-stop* or *t-stop*.

apple box A totally enclosed sturdy wooden box with a grip hole in either end. Used as a small platform for elevating *props* and equipment, for leveling uneven surfaces, and for standing or sitting. There are four commonly used sizes: full apple (12" x 8" x 20"), half-apple (12" x 4" x 20"), quarter-apple (12" x 2" x 20"), and eighth-apple or *pancake* (12" x 1" x 20"). See figure A.1.

arc A high-*intensity lamp* that creates an intense *specular* light when electrical *current* sparks continuously between negative and posi-

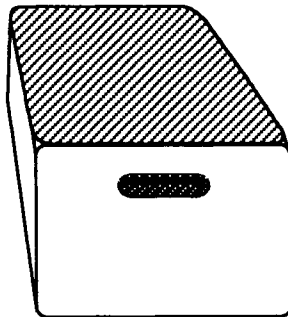


Figure A.1 Apple box

TABLE 1. ANSI RATINGS OF COMMONLY USED TUNGSTEN-HALOGEN LAMPS, in order of ascending wattages.

<i>ANSI Code</i>	<i>Watts</i>	<i>Kelvin</i>	<i>Finish</i>	<i>Bulb</i>	<i>Base</i>
FEV	200	3200	Clear	T-4	DC-Bayonet
DYG	250	3400	Clear	G-6	2-Pin Pf.
EHR	400	3000	Clear	T-4	Rec. SC
FDF	500	3200	Clear	T-3	Rec. SC
EGC/EGD	500	3200	Clear	T-4	Med. Pf.
FGD	500	3200	Clear	T-4	Rec. SC
EGN	500	3200	Clear	T-6	Med. Bipost
EHC/EHB	500	3200	Clear	T-4	Med. 2-Pin
DYS/DYV	600	3200	Clear	G-7	2-Pin Pf.
DYR	650	3200	Clear	G-7	2-Pin Pf.
FAD	650	3200	Frost	T-4	Rec. SC
FBX	650	3200	Clear	T-4	Rec. SC
DWY	650	3400	Clear	T-4	Rec. SC
FCX (Med.)	650	3200	Clear	PAR 36	Fer. Contact
FCW (Wide)	650	3200	Clear	PAR 36	Fer. Contact
FAY (Med.)	650	Daylight	Clear	PAR 36	Fer. Contact
EGR	750	3200	Clear	T-7	Med. Bipost
EJG	750	3200	Clear	T-3	Rec. SC
EHF	750	3200	Clear	T-5	Med. 2-Pin
EGT	1000	3200	Clear	T-7	Med. Bipost
FEL	1000	3200	Clear	T-6	Med. 2-Pin
FFT	1000	3200	Clear	T-3	Rec. SC
FCM	1000	3200	Clear	T-3	Rec. SC
EGJ	1000	3200	Clear	T-6	Med. Pf
DXW	1000	3200	Clear	T-5	Rec. SC
CYV	1000	3200	Clear	T-7	Mog. Bipost
Q1000 PAR 64	1000	3200	Clear	PAR 64	Ext. Mog. Ep
Q1000 PAR 64	1000	Daylight	Clear	PAR 64	Ext. Mog. Ep
FDB	1500	3200	Clear	T-4	Rec. SC
CXZ	1500	3200	Clear	T-10	Mog. Bipost
BWF	2000	3200	Clear	T-8	Mog. Screw
BWA	2000	3200	Clear	T-8	Mog. Bipost
FEY	2000	3200	Clear	T-8	Rec. SC
FFW	2000	3200	Clear	T-3	Rec. SC
CYX	2000	3200	Clear	T-10	Mog. Bipost
DPY	5000	3200	Clear	T-20	Mog. Bipost
DTY	10,000	3200	Clear	T-24	Mog. Bipost

tive rods or electrodes. Arc sources may be open-arc as with the *carbon arc lamp*, or enclosed-arc, as with the *xenon* and *HMI* lamps. The brightest and hardest artificial light source available is the carbon arc, invented by Sir Humphrey Davy in 1801. It is frequently seen today in the searchlights that sweep the skies at grand openings and public events.

arc shot A shot in which the camera moves in a partial or full circle around the subject.

art card A stiff rectangular sheet of cardboard having at least one white surface, used as a *reflector board* or *bounce board*.

art department A term referring to all the personnel working together on designing, creating, and coordinating the visual elements of the film, apart from the *camera crew* and *electrical crew*. The art department is led by the *production designer* or *art director* and includes the various draftspersons, painters, construction personnel, and sometimes the wardrobe and makeup personnel along with the special effects technicians.

art director The person responsible for the design and overall physical appearance of the created world in which the actors appear. The art director must design and oversee the construction of settings; help select and then be in charge of adapting locations outside the *studio*; be responsible for the decoration of settings and the selection of *props*; oversee the design of costumes or be responsible that they properly fit into the overall decor of the production; and sometimes prepare continuity sketches for actual shooting. The art director must also have a knowledge of all technical aspects of film and video production, including cinematography and video technology, as well as a sound sense of economics. He or she supervises the *art department*, which often has a wide array of personnel to implement these duties. On large productions, this person is referred to as the *production designer*, whereas the *set designer* is often called the art director.

articulated arm An adjustable appendage containing ball and socket joints at regular intervals, used to hold a *gobo* from a *C-stand* or camera in a wide variety of angles.

artificial light Light that emanates from any source other than the sun or sky.

ASA rating A numerical rating of the sensitivity of film *emulsion* to light as determined by the American Standards Association (now the American National Standards Institute). The ASA number itself has been phased out by Kodak and other manufacturers in favor of *ISO* (for International Standards Organization), which includes

the European index *DIN* (Deutsche Industrie Norm). ASA and ISO refer to the same system, but nowadays *exposure indices* are labeled on nearly all film packages as ISO numbers. The film's ASA is often stated as part of the trade name, for example, Kodachrome 100. Most *cinematographers* use the term *EI* (exposure index) instead of ASA or ISO.

ashcan A 1,000 *watt* floodlamp.

aspect ratio The proportions of a projected film frame or television screen, based on the ratio of width to height. The general aspect ratio of silent film, established by Thomas Edison, was set at 1.33:1. The advent of optical sound stripes on film in the late 1920s created a more square, less aesthetically pleasing frame, which led to the adoption of the academy aperture, a 1.33:1 frame created by masking the image in the projector gate at the time of screening. The NTSC television standard adopted the 1.33:1 in the mid-1940s (followed by PAL and SECAM in Europe) in accordance with the motion picture standard of the day. The inroads made upon the film industry by television led to the creation of a number of "wide screen" aspect ratio formats in order to regain audience share.

The most popular film aspect ratios in use today are 1.33:1 (16mm films and standard television), 1.66:1 (European films), 1.85:1 (American standard wide screen), 2.20:1 (70mm and 35mm Vistavision films), 2.35:1 (Anamorphic 35mm [Panavision]), and 2.40:1 (SuperPanavision). High-definition television, both Japanese analog and the new digital *HDTV*, utilizes a 16:9 (1.76:1) ratio. Letterboxing refers to the practice of masking the 1.33:1 television screen with black bands across the top and bottom to accommodate a wide-screen picture without cropping the image.

The height proportion of an aspect ratio is generally understood to be a unit of one; thus only the width is stated. For example, an aspect ratio of 1.33:1 is stated as simply 1.33 (the same as a 4:3 ratio).

assistant camera person, first (first AC) A member of the *camera crew* responsible for proper maintenance of the camera, magazines, and *camera logs* during photography. The first AC is responsible for assisting the camera operator and performs such functions as pulling *focus*, *aperture*, and *zoom*, changing lenses and magazines, checking and cleaning the film gate, and other related duties. Also called *focus puller*. See also *assistant camera person, second*.

assistant camera person, second (second AC) The individual responsible for loading and downloading camera magazines, changing lenses, magazines and *filters*, keeping *camera reports*,

placing actors' markers, maintaining the slate, marking each take, and preparing exposed film for delivery to the lab. Also called *clapper/loader*.

assistant director (AD) The person who handles a number of managerial duties during production, including scheduling shoots, arranging logistics, calling actors and crew to positions, maintaining order on the *set*, checking budgets, communicating with personnel, rehearsing performers, and in general relieving the *director* of many chores involved in production. The AD also organizes any large crowd scenes and gives the commands to start filming and sound recording for the takes. Often, second and third ADs are employed to assist the first AD.

atmosphere The mood or ambiance of a scene created by setting, costumes, makeup, color, lighting, and other visual and aural elements in a production. Also, a term used to refer to the extras in a scene.

atmospheric perspective See *aerial perspective*.

attenuator A *filter* that modulates from a specific *density* to clear glass or acrylic; a *graduate*.

automatic dialogue replacement (ADR) A procedure in which actors rerecord spoken lines in a sound studio to replace unusable dialogue recorded on location.

automatic exposure A reflective light metering system used in video and certain still and motion picture cameras that automatically adjusts the *iris* in response to light levels within the field of view.

available light Light existing naturally within a given area. Documentaries, independent films, and low-budget productions are often shot using only available light.

B

baby (1) A focusing *Fresnel* fixture with a 1,000 *watt lamp*. A standard baby head weighs 8-3/4 pounds, features a 6" *condenser* lens, and measures 11-1/4" x 8-5/8" x 10-1/2". See figure B.1 (page 10). (2) Designating any stand or lighting mount incorporating a 5/8" mounting pin—e.g., a *baby plate*.

baby baby A focusing *Fresnel* fixture with a 1,000 *watt lamp*, lighter and more compact than a standard *baby*. A baby baby head weighs 7 pounds, features a 4-15/16" *condenser* lens, and measures 9-1/4" x 7-3/8" x 8-7/8" in overall size.

baby deuce See *baby junior*.

baby junior A focusing *Fresnel* fixture incorporating a 2,000 *watt lamp* in a standard *baby* body; the baby junior is lighter and more compact than a standard *junior*. The head features a 6" *condenser* lens, measures 11-1/4" x 8-5/8" x 10-1/2", and utilizes a somewhat larger bottom tray to accommodate a 2,000 watt FEY lamp. Also called a BJ.

baby plate A metal plate with a 5/8" pin protruding from the center, used for mounting small fixtures (such as *babies*) to wooden surfaces. The plate may be fastened to a wall, ceiling, or *apple box* by means of nails or wood screws. Baby plates are available with pins in three length sizes—with 3", 6", and 12" pins. A hole in the end of the pin may receive a cotter pin or bent nail in order to secure fixtures when hanging upside down. See figure B.2 (page 11).

baby soft A soft light incorporating a single 1,000 *watt* or two 500 *watt lamps*.

backdrop A large screen, photographic enlargement, or painted scene, used to represent a naturalistic landscape or a general *limbo effect* behind a subject on a *studio set*.



Figure B.1 A standard baby. Courtesy of the Mole Richardson Company.

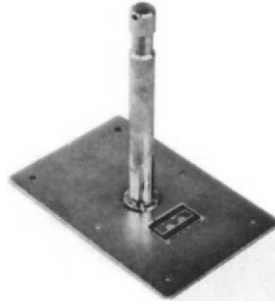


Figure B.2 Baby plate. Courtesy of Matthews Studio Equipment, Inc.

background light *Illumination* directed at a wall or background of a *set*, used to define the character of the background surface and separate the background from the subject.

background plane The rearmost area of a *set*. The background plane is usually lit to create a clear separation between it and the subject.

background plate A projected photographic still used as a background in a shot.

backing (1) A *backdrop*. (2) The coating on the base side of a film, the rem-jet or *balation* coating.

backlight Separates the subject from the background. Also called *separation light*, it refers to a light source pointed away from the background (as opposed to *background light*) and aimed toward the camera lens from above and behind the subject (as a *hair light*) or behind and to the side (as a *kicker*). The backlight is often eschewed by professionals who disdain the use of *unmotivated light*.

baffle A circular *shutter* with a series of slats that fits over the front of a fixture and directs the light while controlling its *intensity*.

Bailin bracket An accessory adapter that fits into the receiver of a stand and holds a 2" x 4" or 2" x 6" plank. Bailin brackets are generally used in pairs with two rolling stands to make an *overhead beam*.

bailing wire A thin, flexible, bare coiled wire used for rigging *barn-doors*, *snoots*, and *aerial mounts*.

balance, color See *color balance*.

balance, lighting The relationship of illuminated areas and shadows in a scene that allows (1) sufficient *exposure* for photographing the subject, (2) movement of the camera between areas of different *illumination* that will not detract from the initial exposure, and (3) a satisfying compositional effect.

balance, white See *white balance*.

ballast A device that regulates *voltage* and serves as a starter in an *HMI*, *arc*, or other discharge-type *lamp*. A ballast is often housed in a heavy separate box that must accompany the fixture. A significant development in HMIs is the new flicker-free ballast that utilizes a square-wave technology, although this design operates at a higher noise level. Many newer ballasts have been scaled down in size substantially due to the adoption of electronic circuitry. See figure B.3.

bangi mount A double-railed extension mount for offsetting a camera from the tripod or other mount, used most often in extreme tilt shots, for example, when shooting an extreme high-angle shot over a bed. Also called a ubangi mount.

bank A group of lights positioned to create a larger or more powerful source, as in a *nine-light* cluster.

bar clamp See *furniture clamp*.

bar clamp adapter A mounting accessory designed to slide onto the shaft of a *furniture clamp* or *C-stand* arm in order to affix small lighting fixtures or *grip equipment*. The bar clamp adapter can also be used by inserting the 5/8" pin into a *grip head* and employing the locking shaft opening to secure a particular device. The adapter will also work on a C-stand arm to hang a light over a subject.

Bardwell & McAllister, Inc. A supplier of lighting equipment for the film and television industries, based in Burbank, California.

barndoor A lighting accessory made up of two or four hinged *blades* that attaches to the front of a lighting fixture. The barndoor can be rotated and the blades independently adjusted to direct and shape the beam, control *spill light*, create shadows, and prevent the *lamp* from flaring in a camera lens. See figure B.4 (page 14).

barney A flexible waterproof covering for a motion picture camera, generally used to dampen mechanical noise emanating from the camera mechanism and magazine.

base light Overall diffuse *illumination* on a *set* to ensure an adequate light level for video cameras.



Figure B.3 Ballast and HMI light. Courtesy of the Mole Richardson Company.

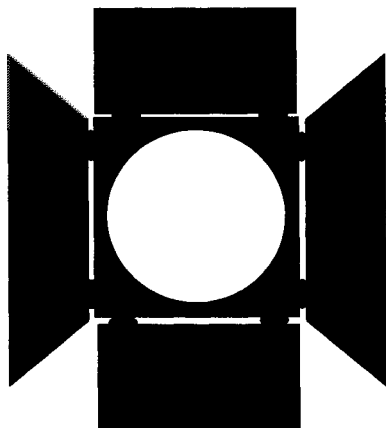


Figure B.4 Barndoor

base plate A low *pedestal* with a stud for mounting a fixture.

base-plus-fog density The minimum *density* of unexposed film, consisting of the sum of the translucency of the base material plus any fogging of the *emulsion* due to heat or x-ray exposure. See also *D min.*

basher A small 250 or 500 *watt lamp* used as a *spotlight* or *eyelight*.

Basso block A stacking lightweight elevating support consisting of a small platform with two block feet. Basso blocks are similar to but lighter and more compact than *apple boxes*.

batten A long pole for supporting instruments or scenery.

battery A relatively compact source of *dc* electrical power. A battery is often made up of a number of dry or wet cells. Most batteries used in film and television production are rechargeable. There are three basic types of battery generally used for lighting applications: lead acid, heavy antimony, and nickel-cadmium (*NiCad*). Alkaline and zinc-manganese cells find little use in heavy production.

battery belt A belt that holds batteries to power a camera or handheld light.

bazooka A pole-shaped accessory for mounting instruments on *studio catwalks*, similar to a legless *junior stand*. The bazooka has a 1-1/8" stud that fits in one of a series of sockets placed at 18" intervals in the catwalk floor. A hole at the top of the bazooka may be fitted with a receiver or hook that fastens to the catwalk handrail. The



Figure B.5 Bazooka. Courtesy of Matthews Studio Equipment, Inc.

bazooka may be extended with an adjustable *riser* and will receive a 1-1/8" *spud* for mounting large fixtures. See figure B.5.

beach it, to (verb) A colloquial expression, meaning to anchor a floor fixture by means of *sandbags*.

beadboard Polystyrene bead foam sheeting available in 4' x 8' x 3/4" sizes. Its highly porous surface makes it an excellent *reflector* and a good sound insulator. Originally used as insulation for housing, it is often used as a bounce material for the soft diffuse quality of its bounce light. Some beadboard comes backed in silver foil, which creates a hard bounce surface. Beadboard cannot stand intense heat and should not be positioned too close to a *PAR* or an *open-faced* fixture.

beadboard holder A pair of vise grips having a flat metal plate affixed to each jaw. The large surface area of the gripping plates allows the vise grips to grasp the brittle *beadboard* without breaking the foam. Also known as a *quacker*.

beam angle The point at which the *intensity* of a source drops to fifty percent of maximum (center reading) measured in degrees of the full angle.

beam coverage The area that a *lamp* can illuminate with 50 percent of its peak *intensity*.

beam lumens The amount of light within a light *beam angle*.

beam projector A *spotlight* that directs a narrow beam of light.

bear trap A strong clamp used for affixing a fixture. See also *gaffer grip*.

beaver board A *junior pigeon* mounted on an *apple box*.

becky A wall-mounting accessory featuring two *baby* pins, similar to a *trombone*. The becky adjusts at the top only and does not telescope.

beef The output of a light.

beefy baby Heavy-duty 1K stand without wheels.

behind-the-lens filter A *filter* or *gel* inserted behind the lens of a camera. Such filters are more compact and convenient than large over-the-lens filters and are not susceptible to flaring.

best boy (girl) The key assistant to the *gaffer* or *lighting director*. The title best boy has been largely supplanted by the terms second electric or simply second, or assistant chief lighting technician. The duties include:

1. All electrical chores, including performing *tie-ins* or *generator* hookups, cable runs, load balancing, and maintaining electrical equipment.
2. Direct supervision of the lighting crew. On large productions, the second electric also selects and schedules electricians and sees that their time sheets are filled out.
3. Managing equipment. The second coordinates with production to ensure that all equipment requested is available and accounted for and works out plans for swing trucks, *rigging* crews, and strike crews. He or she should be able to tell the gaffer what lights are in use and what is still available.
4. Staging. The second should be ready to maneuver for a suitable staging area and then supervise unloading the equipment and preparing it for use. He or she is also responsible for returning the equipment to the truck safely at the end of the day. On large productions many of these functions will be performed by the third or fourth electric, while the second stays on the truck doing paperwork.

best boy (girl) grip The direct link between the *key grip* and all other *grips*. The best boy grip acts as a foreman, taking orders from the key grip and directing each subordinate grip in completing his or

her assigned task. The best boy grip is also responsible for all grip equipment and *expendables* (including *diffusion* material, colored *gels*, nails, and tape) on the grip truck, and keeps an inventory of everything that goes out and comes back. It is his or her job to ensure that there are sufficient expendables for the duration of the shoot. Another important duty of the best boy grip is to give a status report to the key grip of the work in progress and to give an honest and highly accurate (within 3–5 minutes) estimate of how long each job will take.

Big Ben clamp A *grid clamp* that accepts any *junior* receiver and firmly locks to any 1"- to 2"-diameter tubing.

big eye A 10,000 *watt* enclosed fixture incorporating a large 24" *Fresnel* lens. Manufactured by the *Mole Richardson Company*. See figure B.6 (page 18).

bipost lamp A *globe* having two pins on its base.

black body A theoretical carbon body having 0 percent *reflectance*, used as a standard to determine *color temperature* of *radiating sources* in degrees *Kelvin*.

black gamma The relative *density* of black *values* in a video signal, as compared to *gamma* in the white and gray ranges. Black gamma is controlled in video by raising the *pedestal* or *black level*, which is analogous to postflashing in film.

black level The darkest level of a film or video image.

black limbo An effect utilizing black cloth such as *duvetyne* to create a smooth, featureless *backdrop* behind a subject for maximum separation. The black limbo effect is often used in *matte* effects.

black net A black fabric gauze stretched on a frame and mounted on a C- or other stand. It is used in front of a light to *take down illumination* on a subject.

blackout switch The master switch in a *studio* that extinguishes all lights.

blacks Any black fabrics or materials used to cover doors and windows to keep out extraneous lights. They are often used when shooting night scenes during *daylight* hours.

blackwrap A heavyweight flexible *matte* black aluminum foil used for improvising *gobos* and *snoots* and for use as a heat shield between a hot fixture and a heat-sensitive surface.

blade A narrow *flag*, used to *take down* small *hot spots*. Blades may be *opaque* or *translucent* and are usually mounted on *articulated arms* or *goosenecks* and inserted into the beam of a source.



Figure B.6 Big eye. Courtesy of the Mole Richardson Company.

bleached out A term used to describe a film or video image that has been overexposed and lacks overall *density* and detail.

bleeding A dispersion of light, color, or line around the edges of a *matte*, title, or image resulting from a camera misalignment or poor film registration.

blocked up Devoid of detail, said of overexposed *highlight* or underexposed shadow areas in an image that are so dense or thin that they do not exhibit any detail or only exhibit *values* that appear to be completely white or black.

blocking The staging of actors on a *set* in relation to the camera.

blonde An *open-faced* 2,000 *watt* fixture. See also *mighty*.

bloom, to (verb) To apply *dulling spray* to an illuminated surface, in order to bring down a *reflection*.

blooming Excessive light glare in an image, especially when accompanied by *halation*.

blue-screen process A special effects process whereby a subject is photographed before a special blue *backdrop* and superimposed in front of a wholly separate background. The process is used in conjunction with a variety of special effects, including miniature photography, flying effects, outer space scenes, and other shots utilizing a fantastic or surreal effect. In video production, a similar process is known as *chroma key*.

bobbinet A black mesh cloth used for *nets* and stretched fabric *scrims*, which cuts light *intensity* without altering its quality. Bobbinet features a hexagonal weave that minimizes cast patterns on subjects.

boil-off The tendency of standard *incandescent lamps* to disperse molecules of *tungsten* from the *filament* to the inside of the *envelope*. This boil-off continues with lamp use, resulting in a steadily wasting filament and a gradual darkening of the light bulb. See figure B.7 (page 20).

boom An extendable pole affixed to a light stand, to which a lighting fixture is mounted in order to move with or across a subject.

boomerang A receptacle in front of a fixture that holds *filters*. Boomerangs are a built-in feature of many *follow spotlights*.

boom shadow A shadow cast by the microphone and *boom*. Boom shadows are the bane of the *gaffer* and the *director of photography*, as they necessitate a change in lighting or shift in microphone position.

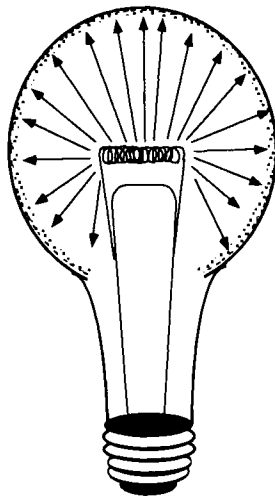


Figure B.7 Boil-off in a standard incandescent lamp. Boil-off occurs in an incandescent lamp when the filament gives off molecules of tungsten, which are deposited on the inside of the glass envelope, darkening the bulb.

booster A *transformer* that increases *voltage* in *lamps* during shooting in order to achieve a higher degree of *illumination* than the nominal wattage normally allows.

booster blue A #80A *filter* used to boost the *color temperature* of *tungsten lamps* from 3,200 degrees K to 5,500 degrees K. See also *tough blue*.

border light See *striplight*.

bottle Slang for *globe* or *lamp*.

bottom chop A *flag* or *cutter* positioned to keep light off the bottom portion of a *set* or floor.

bounce board A large white card such as *foamcore* used as a *reflector*. Such cards offer limited *reflectance* and must be placed close to subject to be effective.

bounce lighting A large diffused source created by reflecting light off white- or neutral-colored surfaces, as ceilings, walls, or *reflectors*.

box A *set* with four walls.

brace A strut that supports *flats* and other scenery.

brace stand A *senior stand* having three additional struts on the center column for additional support and featuring a *pop-up casting*.

bracket One of three or four hooklike supports on the front of a lighting fixture to hold *barndoors*, *scrims*, and other accessories.

bracketing The practice of exposing film at the *f-stop* designated by the *light meter* and then shooting at *apertures* lesser and greater to ensure an optimum *exposure*.

branchaloris A tree or shrub branch used as a *cukaloris*.

branch holder A small cylindrical adapter with a thumb screw and 5/8" pin used to mount a fixture on a tree limb, dowel, or other rodlike appendage.

breast line A guide line attached to anything hauled up by a crane, pulley, or freehand.

brightness Ability of a surface to reflect or emit light. Brightness of a light source is properly called luminosity or *luminous intensity*, while brightness of a reflecting object is known as *luminance*.

brightness range The ratio between the darkest and lightest portions of an image.

brilliance The intensity of a color or colors in an image. See also *saturation*.

broad A rectangular *open-faced luminaire* used for even lighting in background, bounce, and fill lighting situations. Derived from "broadside," an old term that originally referred to an *arc lamp* used for photoengraving plates. See figure B.8.

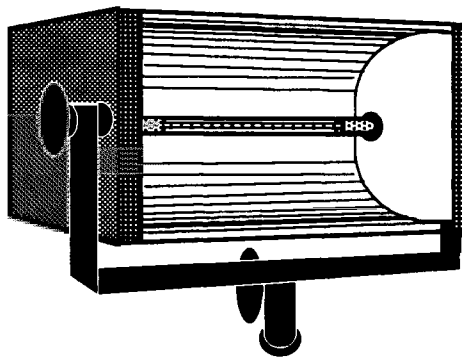


Figure B.8 A broad is a rectangular open-face fixture used for lighting large, broad, flat areas such as backgrounds, hence its name.

broom back, to (verb) To clear fixtures and stands off a *set* to prepare for the next *setup*.

brute A large 225 amp *carbon arc* fixture, the largest single fixture used in production. Sometimes nine- and twelve-light *PAR clusters* are also called brutes. See also *carbon arc*.

bulb An *incandescent* or *discharge lamp* consisting of a metallic base or bases, a *filament* or two electrodes, and a surrounding glass *envelope*. The bulb, more properly called a lamp or *globe*, is generally housed in a lighting fixture. Also known colloquially as a *bottle*.

bullet The mirrorlike surface of a *shiny board*, so called for its ability to throw a hard *specular* beam of sunlight over great distances.

bull prick A *grounding rod/spike*.

bull switch A portable electrical disconnect switch with *fuses* for each hot *leg*. These switches come in 60-, 100-, and 300-*amp* sizes, most often with bladed cartridge fuses. A bull switch should be put in every distribution system, usually right after the *tie-in* or *generator*. It may also be placed as a master switch to shut the entire system down.

bus-bar lug A type of heavy electrical connector used for connecting *feeder cable* to a bus bar in an electrical main *tie-in*.

butterfly A large *net* or *silk* measuring at least 4' x 4', stretched on a frame and supported by a single stand. The butterfly, commonly used outdoors to shade or diffuse direct sunlight, is big enough to cover a medium- or two-shot and reduce the harsh look of hard sunlight. When a *translucent* material is used on a butterfly frame, it is called a silk. When a butterfly frame is stretched with black *duvetyne*, it becomes a *solid* (really a giant *flag*). See figure B.9.

butterfly bag A *sandbag* with a handle running edge-to-edge, allowing the two sand compartments to separate and thereby slip easily off a *riser stand leg*.

butterfly lighting A type of portrait lighting popularized by George Hurrell and other glamour photographers of the 1930s, most often used for portraits of starlets and other attractive young women. It is characterized by a high overhead frontal *key light*, which lights the face fully and casts a small "butterfly-shaped" symmetrical shadow beneath the subject's nose.

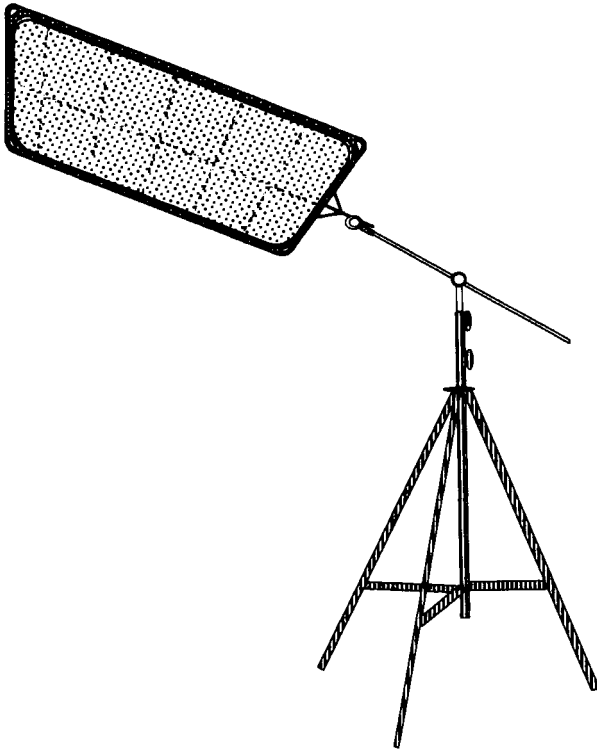


Figure B.9 A butterfly



cable A heavy insulated wire or combination of separately insulated wires, used for conveying electrical *current*.

California scrim set A set of *scrims* that includes two *double scrims*.

Callier effect The scattering of light as it passes through optical systems.

cameo lighting *High-key* light that illuminates a subject in relief against a dark or black background.

camera crane A large power-operated platform that allows the camera to be moved smoothly into any position on the *set*.

camera crew The personnel directly responsible for cinematography or videography of a production. This group is headed by a *director of photography* who designs the lighting and orchestrates camera angles and movements and includes the *camera operator* (a function sometimes performed by the *DP*), the *first* and *second camera assistants*, and one or more *grips*.

camera leading A *dolly* shot that depicts an approaching subject while the camera itself moves back, maintaining a constant distance between the two.

camera log See *camera report*.

camera operator A member of the *camera crew* who is responsible for physically photographing the shots. The camera operator is responsible for viewing the scene through the viewfinder and making sure that the shot is correct, positioning the camera, and making basic movements.

camera rehearsal A staging of the *action* of a shot or scene with actors or stand-ins that also includes camera movements.

camera report A document containing information concerning cinematography that is sent along with film to be processed by the lab. Camera reports usually include information regarding *emulsion*, footage, sound recorded, and any special instructions such as *force processing* or *flashing*.

camera setup The location of the camera in relation to the *set*.

camera support Any mount for the camera, such as a *tripod* or *pedestal*.

camera tape A strong one-inch-wide cloth-backed tape. White camera tape is often used for labeling film magazines, cans, and clapper boards; black tape is used for sealing magazines and cans from light leakage. Compare *gaffer tape*.

camera wedge A small wooden wedge (measuring approximately 4" long by 1/2" wide, tapering down one end to 1/16"). Camera wedges may be fashioned from clothespins with the center spring removed. They are often used for securing and shoring up camera mounts.

Camlok An electrical *feeder cable* connector. Similar to a *Tweco*, it features a more reliable, locking, water-resistant design.

candela A unit of light *intensity* equaling the light emitted by 1/16 square centimeter of a *black body reflector* at 2,042 degrees *K* (the melting point of platinum). The candela supersedes the older *standard candle*.

carbon arc A high-*intensity*, low-*voltage lamp* that creates an intense *specular* light by arcing electrical *current* between two carbon rods. The carbon arc lamp is noisy and must be constantly "trimmed" by a technician, and it is often used to simulate or fill in the dazzling light of the sun. The carbon arc produces its light when high *amperage dc* current is applied to one of two carbon rods or electrodes within the lamp housing. A stream of electrons in the current forms a brilliant arc as it jumps a narrow gap between the two carbons. As the lamp burns, the feed rod oxidizes and must be continually adjusted or "trimmed."

The carbon arc most frequently used for film and television work is the 225 *amp Brute*. No lamp better simulates the intense light of the sun or the *hard light* of the moon than this one does. The *correlated color temperature* of a *white flame* carbon arc is 5,800 degrees *K*, which closely matches *photographic daylight*.

For all its advantages, the carbon arc has some distinct limitations. A bulky and heavy fixture, it requires a *dc generator* for power. The typical carbon arc requires a voltage of 72 *volts*, which is supplied by a resistive *grid* or *ballast* that converts the normal 120 volts *dc* provided by most generators. It requires a technician to continually trim and replace carbons every forty minutes, making it an expensive lamp to operate. See figure C.1.



Figure C.1 A carbon arc. Courtesy of the Mole Richardson Company.

carpet tack tape See *double-faced tape*.

car rig An apparatus used to photograph a moving car on location, consisting of a *grid* of pipes holding lighting and sometimes the camera itself, attached to the automobile. The rigged car is often towed during shooting so that the actors may act without the distractions of actually driving the vehicle.

cartridge-type fuse A cylindrical electrical *fuse* with point contacts on either end, as distinguished from a screw-mount fuse. See also *fuse*.

cast shadow An area of shadow thrown on a background, floor, or other surface, caused by an independent object obstructing light. See also *core shadow*.

catwalk A narrow, railed walk suspended above the stage in the *studio* for lighting, sound equipment, and *rigging sets*.

C-boom clamp A clamping device that converts a standard *Century stand* into a *boom* arm. The Century stand locks securely in place with a threaded T-handle. The arm is balanced before tilting by mounting the instrument and then counterbalancing the opposite end with *sandbags*. The C-boom clamp has a fork fitting for mounting in a 4-1/2" *grip head*.

CCD See *charge-coupled device*.

CC filters Color-compensating filters. A series of *filters* in progressive degrees of red, green, blue, *yellow*, *magenta*, and *cyan* densities. CC filters are used for adjusting the color of a scene by filtering either sources or the camera or both; they are also used in photographic printing. The CC magenta 30 filter, for example, is often used for converting fluorescent light to *daylight*.

C-clamp A C-shaped screw clamp used to fasten a fixture to an overhead pipe or *grid*. C-clamps are used when it is necessary to make an extremely secure quick mount, and they come in numerous sizes. Some C-clamps come with two flat faces, while another type comes welded with a piece of angle iron that will fit snugly onto a pipe. When using a C-clamp on a surface that can be marred, it is wise to use pieces of *cribbing* to distribute the foot/face load.

CdS cell A cadmium-sulfide light-sensitive cell used in most reflected *light meter* designs. CdS cell meters require a power source such as a *battery* and measure light *intensity* when light falling on their surface creates *resistance* in the meter's electrical *circuit*. CdS cells are very sensitive to low light but exhibit some lag problems in changing light conditions.

celo A type of *cukaloris* consisting of a wire mesh frame covered with a plastic that has irregular patterns burned into it. The celo's overall translucence gives a diffused mottling effect that is generally more pleasing than the pronounced pattern cast by the *opaque* wood or card *cukaloris*. See figure C.2.

Century stand An all-purpose three-legged adjustable stand used to hold *gobos* in front of a light source. The legs are staggered in height allowing them to fit in, around, and under furniture, *props*, and other lighting stands. A *Rocky Mountain* or *sliding leg* is available on some stands, which permits one leg to be raised so it can rest on an elevated surface, such as a stair step, counter, rock, or other object. The standard 40" double raised stand can reach approximately 13'8" and weighs about eleven pounds. Century stands are constructed of durable lightweight alloys. Each *riser* is a tube inside a larger tube, which will telescope about 38" long and is held in the next tube by a flair or bead on the end. The Century stand is used with an accessory called a *grip head*, which holds a 40" tube or extension arm with another head on it called a *gobo head*. The grip head mounts on the Century stand by means of a 5/8"-diameter pin, the standard size for most lighting units under 2,000 *watts*.



Figure C.2 A celo casts a patterned shadow with greater subtlety than the similar *cukaloris*. Courtesy of Matthews Studio Equipment, Inc.

All 2-1/2" grip heads and gobo heads are designed to receive 5/8", 1/2", and 3/8" round accessories. They will also accept an object of irregular shape, if not in the holes, then between the flat plates as marked. The head consists of a knob or *knuckle* and an outside or inside plate that butts up to a flat portion of the head. The plates keep their hole alignment by an alignment pin between the outer and inner plates, which are attached to one plate while the other plate has a hole for free floating.

The Century stand should always be used with the knuckle "on the right" (see *right-hand rule*). The reason the knuckles are on the right is that any time a flag or gobo is put in the head, gravity will pull it downwards. The knuckle or knob is tightened clockwise. The weight of the flag will cause the head to bite by pulling down (clockwise), causing a friction action and locking it in place. The stand must be placed with the knuckles on the right and with one leg placed in a forward position. This will help support the weight of an object such as a *flag* and keep it from falling over forward. In order to prevent the stand from toppling, a *sandbag* is usually placed on the rearmost leg to act as a counterbalance.

If a large object such as a piece of 1" x 3" lumber is placed in the gobo head, it is wise to insert a *wedge* in the bottom of the head on the other side. Let the head bite the 1" x 3"; then slide the wedge in. Now tighten the knuckle or knob until they are both clamped in the head. The wedge is used to prevent bending in the threaded rod that holds the locked plates of the head. This is also a good procedure to follow when working with *overhead stands*. See figure C.3.

C-47 A nickname for the wooden clothespin used to clamp *gels* to *barndoors*. The name C-47 supposedly stems from a production manager's desire to give the mundane laundry clamp a more technical title in order to take tax writeoffs without fear of questions from the Internal Revenue Service. Another apocryphal story has the clothespins originally stored in a bin labeled "C-47" during one production.

chain vise grip A vise grip with a length of bicycle chain attached at either end to the grip jaws. The chain vise grip will fasten to pipes with an outside diameter of 6" or smaller. It has a 5/8" pin on one handle, and another on the tightening screw.

characteristic curve A graphic depiction of a film's sensitivity and *contrast* characteristics, consisting of a curving line representing the change of *density* of an image as *exposure* is increased. Also called *H & D curve*. See figure C.4.

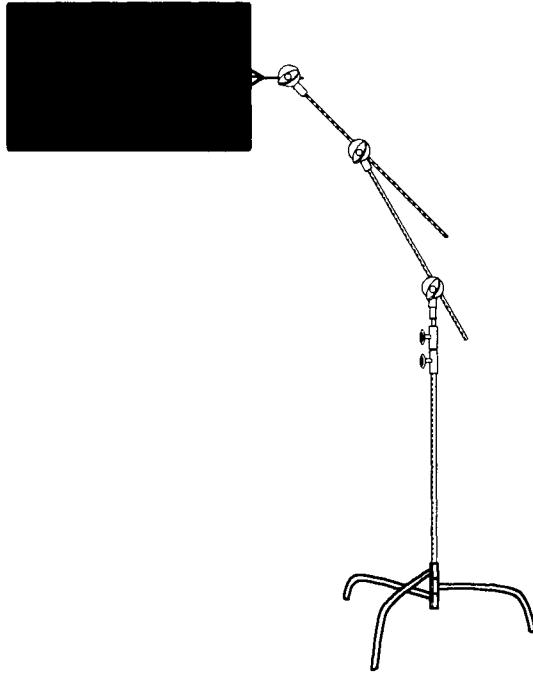


Figure C.3 Century stand with double arm head assembly holding a flag

charge-coupled device (CCD) A solid-state light-sensitive element that takes the place of a *pickup tube* in a video camera. The image is registered on a grid of thousands of picture elements or pixels. Unlike the pickup tube, the CCD is not subject to imaging defects such as lag and comet-tailing. The CCD does not scan the image with an electron beam as does the tube; the sensor contains thousands of discrete picture elements (pixels), which read the entire image at once. Image resolution or sharpness of detail depends only on the number of pixels in a given chip. Since the image is composed of a mosaic of pixels, an image with very fine detail is apt to cause a "moiré," a distracting wavy-line pattern that occurs with parallel line and grid patterns in the scene. The more pixels that can be squeezed into the chip, the less likely this defect will occur. Otherwise, solid-state sensors are virtually impervious to lag, image burn, and comet-tailing. CCDs are much more accurate than pickup tubes in their rendition of black and shadow areas. This means a less noisy (that is, a less grainy or snowy) image can be captured with solid-state sensors.

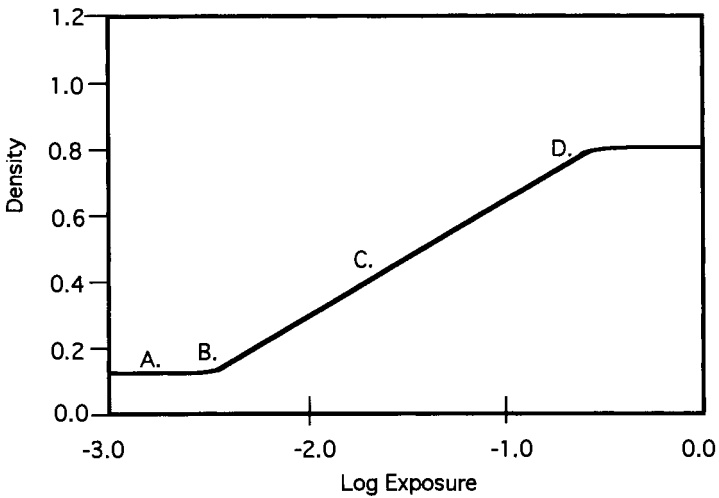


Figure C.4 A typical characteristic curve illustrates how a film's density increases with exposure. The inherent density of the film base itself, including some fogging, is represented at the far left (A). Details of a scene dark enough to fall in this portion will not reproduce. The toe (B) is where small amounts of light begin to become exposed. The straight line portion (C) shows how density increases proportionately with exposure. The shoulder (D), or knee, marks the point where increased exposure no longer produces any significant density change; high-lights block up and lose detail beyond this point.

cheat, to (verb) To artificially change the position of a subject from that of another shot in the same scene to allow for a more advantageous angle or in order to preserve lighting continuity.

checkerboard A *reflector board* combining alternating squares of gold and silver *Griffolyn* sewn together.

check light A type of *separation light* where the outer contour of a subject's cheek is given a *kick of edge light*.

cheek patch See *Rembrandt cheek patch*.

cherry picker A truck-mounted crane that can raise a *camera operator* to a great height.

chiaroscuro (pronounced key-AR-oh-skew-roh) Literally light-dark. A high-contrast modeling of light and dark *values* in a subject, often with very little modulation between *highlight* and shadow, as seen in the work of master painters such as Caravaggio and Rembrandt.

chicken coop An overhead *bank* light consisting of a box housing a *cluster* of six 1,000 *watt globes*, which is covered in front with a wire mesh.

chief lighting technician A more accurate term for *gaffer*, who is second in command to the *director of photography*. See also *gaffer*.

China girl The female model portrait that appears in the leader of a film negative of print, containing fleshtones and color and *value* swatches to help the timer or grader in *color correction* during processing.

Chinese dolly A shot in which the camera moves back on slanted tracks while panning the scene.

Chinese lantern A large paper *globe* used as a *diffusion* shade. The Chinese lantern is often used to soften bare *lamps* ranging in power up to 2,000 *watts*.

chip See *charge-coupled device*.

chip chart The *EIA gray scale*, a nine-step scale with *reflectances* of 3.0, 4.4, 6.3, 9.2, 13.4, 19.5, 28.4, 41.3, and 60 percent, used in setting up video cameras. The chip chart is reproduced on the *waveform monitor* screen as a series of discrete steps. It encompasses a *contrast range* of 20:1, with a one-half-stop difference between each adjacent chip.

Christmas tree (1) A single stand that supports several lighting instruments. Also called a *tree*. (2) A small vehicle used for storing and transporting lighting equipment.

chroma The intensity of a *bue* or *saturation* of color; a color without the dilution of white or gray.

chroma key A method of producing *mattes* for creating electronically produced composite images, utilizing a blue or green background screen.

chromatic aberration A defect in lenses that causes colors to be dispersed instead of focusing at a distinct point. Chromatic aberration often appears as a spectral *fringing* around objects in an image.

chromaticity See *color temperature*.

chrominance The color portion of a video signal. Chrominance refers to *saturation* and *bue* of a color, not its *value* (which is included in the *luminance* information).

CID lamp Compact iodide *daylight lamp*. A *metal halide* discharge source similar to an *HMI*, the CID has a *correlated color temperature* of 5,500 degrees *K*. The CID is popular in Europe but finds only occasional use in the U.S.

Cine Check A device that reads and displays the frame rate of a video monitor, used for synchronizing a motion picture camera with a video image, manufactured solely by Cinematography Electronics, Inc.

cinematographer See *director of photography*.

cinemobile See *grip truck*.

circled take The takes circled on the *camera report* by the *second AC*; the circling indicates the usable shots, those to be printed by the lab.

circle of confusion The diameter of the smallest point of light focused on the *film plane* or *video target*. Rays of light from any point before infinity must converge at a point farther behind the lens than the *focal plane* and always form circular patches. The smaller those circles, the less blur or confusion, and the sharper the image. Proper focusing ensures that the circles of confusion are as small as possible.

circuit Any electrical path that includes the energy source.

circuit breaker A device that governs the maximum *amperage* in a *circuit*, automatically interrupting the flow of *current* in an electrical circuit when the wiring is in danger of being overloaded. Circuit breakers have replaced *fuses* in many applications.

clapper/loader See *assistant camera person, second*.

clean exit When an actor or moving subject briskly leaves the frame and disappears from view.

clipboard A small lightweight masonite panel that can clip to the *barndoors* of a fixture, adding an added degree of beam control. The clipboard can sometimes obviate the need for a *flag*.

clipping A defect that occurs in video images that are overexposed, when the peaks of the overmodulated video signal exceed 100 *IRE units* and are "clipped off," resulting in light values rendered as blocked-up whites and often affecting frame synchronisation.

close-up A frontal shot of a person's head and shoulders, emphasizing the face.

clothes light A snooted spot light used to highlight or enhance the texture of areas of a garment worn by an actor.

clothesline *Grip* jargon for a suspended cable not properly taped to the floor or ground; a safety hazard.

clothespin The common wood clamp used for hanging laundry also makes an indispensable heat-resistant tool for fastening *gels* to *barndoors*. Also known as *C-47* or #1 wood clamp.



Figure C.5 Cobweb spinner. Courtesy of the Mole Richardson Company.

cluster A fixture such as a *nine-light*, incorporating several *PAR lamp* modules, used to augment or fill in sunlight.

cobweb gun, cobweb spinner A handheld electrical device with a built-in fan that blows latex-based artificial cobwebs onto a *set*, wall, or ceiling. See figure C.5.

coffin light An overhead *softlight* fixture comprised of a box containing several rows of *lamps*. The lamps may be arranged to point toward a rear *reflector* for indirect light, or face forward toward a *diffusion* screen. See also *soft box*.

cold lens A wide angle flood lens.

color balance (1) The specific formulation of a film *emulsion* that allows accurate color reproduction under a specified light source, usually *tungsten* balanced for light measuring 3,200 degrees K, or *daylight*-balanced for *photographic daylight* measuring 5,500 degrees K. (2) The emphasis placed upon a particular part of the

color spectrum in a film image, as when the overall cast leans toward a specific *hue*, such as red or *cyan*. See also *color cast*.

color-balancing filter A camera *filter* used to achieve correct color balance for a given film *emulsion* and/or light source. The most widely used color-balancing filters are the #85 or *CTO* filter, for shooting *tungsten* film in *daylight*, and the #80 or *CTB* filter, which converts 3,200 *K* tungsten light to a cool 5,500 *K* for matching daylight.

color cast An overall tint in a film image. This may be due to defective *stock*, mismatched source and film *color balance*, or printing errors, or may be introduced for creative effect.

color-compensating filters See *CC filters*.

color correction A laboratory process, where the scenes of a film are selectively printed or reproduced electronically to yield the most pleasing *color balance*. Color correction, done by a timer using a *Hazeltine* or a *flying spot scanner*, is often used to match the colors of shots taken at different times or places, or photographed under disparate lighting or on different *stocks*, in order to preserve continuity within scenes or to provide a cohesive quality to the entire production. Color correction is also used to alter the natural color balance of a shot in order to achieve a certain *color cast* for effect.

Color Rendering Index (CRI) A measurement of the color shift an object undergoes when illuminated by a light source, as compared to a reference source at the same *color temperature*. Color rendering is measured on an index from 0–100, with natural *daylight* and incandescent lighting both equal to 100. On the other hand, the CRI of a *mercury-vapor lamp* is 22. Objects and people viewed under lamps with a high color rendering index generally appear more true to life. Only sources that measure 90 or higher on this scale are considered suitable for photographic applications.

color reversal internegative (CRI) The negative from which the laboratory strikes *release prints*.

color temperature (1) The measurement of various light wavelengths of the *visible spectrum* of a light source. (2) A system for rating the color of a light source by comparing it to a theoretical *black body* radiator. Color temperature is measured in degrees *Kelvin*, which is similar to the Celsius scale (0 degrees *K* = -273 degrees *C*). See also *Kelvin scale*.

color temperature meter An instrument that measures the *color temperature* of a light source in degrees *K*.

combo box A six-pocket *stage box* that can be converted from three-phase four-wire to single-phase three-wire operation.

combo head A 4-1/2" jumbo *grip head* that includes a 1-1/8" receptacle in addition to 3/8" and 5/8" *receivers*. Combo heads are often used in conjunction with heavy-duty *highbay* and *combo stands*.

combo kit A box of assorted *C-stands*, *nets*, *flags*, *silks*, *lavenders*, and *cookies*.

combo/light stand A heavy stand with a 1-1/8" receptacle used for mounting *reflector boards* or fixtures. The combo stand was originally designed for mobile or location production, for use with reflector boards. Standard features are a three-leg base with a folding brace in each leg. The stand is portable yet has enough heft to stand a moderate gust of wind blowing against the reflector surface.

compact fixture A small, portable *prime fixture* drawing fewer than 1,000 *watts*. The Lowel *Pro-light*, for example, is a compact fixture that offers a variety of interchangeable *reflectors* and numerous accessories for the location filmmaker.

compact open-faced lamp A lightweight, portable, and often focusable lighting instrument without a lens. Compact open-faced lamps are often found in portable *location kits*. An example of this type of instrument would be a *Mickey Mole* or a *Pro-light*.

complementary colors Colors opposite the primary colors on the color wheel, namely *cyan*, *yellow*, and *magenta*. When a primary color is subtracted from white, its complement remains; thus, when red is eliminated, its complement cyan (a mixture of green and blue) is left. Complementary colors are used in subtractive color processes; thus, they are also known as the *subtractive primaries*.

composite shot Any shot created from the combination of two or more components of separate shots. Live action, animation, miniatures, and paintings of scenery can be combined for stationary and traveling *matte* shots, *blue-screen process*, and other special effects.

compromise exposure An *exposure* selected as the split of two extreme readings of a *contrast* or *lighting ratio*. For example, a compromise exposure of a subject measuring f-22 on the key side and f-5.6 on the fill side would be f-11, a compromise between the two readings. Compromise exposures are made to ensure maximum detail in both the shadows and *highlights* of an image.

condenser A lens, such as a *Fresnel* or *plano-convex*, that gathers and concentrates light rays from a wide source into a collimated beam, thus increasing a source's *illumination* and *punch*.

conductor A material that facilitates the flow of electrical *current*, such as copper or gold.

construction crew The group responsible for building *sets*.

construction manager The person in charge of the construction of *sets*. The construction manager generally works under the *art director* and directs a large crew of carpenters and builders.

contrast The relative difference between the darkest and lightest elements in an image or scene. Contrast is determined not only by the relation between extremities, but also by the intermediate tonal scale between light and dark. A high-contrast image or scene is one that exhibits very little gradation between the darkest and lightest values.

contrast range The ability of a medium such as film or video to reproduce an image in relation to the tonal scale between light and dark. Video cameras reproduce *values* with a contrast range of around 32:1 or 5 stops, while color negative film can handle a contrast ratio exceeding 128:1 or 7 stops. To create the same overall effect for a scene shot in video, it is necessary to lower the lighting ratio by using more *fill light*. At a given *exposure* level, what would produce marginal shadow detail on film would not register any detail at all on video. For example, a high-contrast exterior night scene may look fine on film but lose crucial detail and block up completely when shot on video. The solution would be to add more fill or *base light* to reduce the inherent contrast of the scene. Lighting for video often requires adapting to its limited tonal range.

contrast viewing filter A dark glass or *filter* used for judging the *contrast* of a scene before photographing. The filter works best when used for only brief periods, so as to not let the eye grow too accustomed to the effect, thus losing the ability to judge contrasts accurately.

converter An electrical device that converts *alternating current* to *direct current* or vice versa, or changes the frequency of a given alternating current. A *voltage* converter is known as a *transformer*.

cook, to (verb) (1) To flood a *set* with superfluous or very hot light. (2) To overdevelop a film by increasing the temperature or process time in order to bring out an underexposed image. See also *forced processing*.

cookie See *cukaloris*.

cool Tending toward the blue end of the spectrum; said of light.

cool light A lighting fixture designed to dissipate heat away from the front of the instrument. Lensed fixtures tend to be cooler than open-faced fixtures.

cool white fluorescent A type of fluorescent tube manufactured by General Electric, designed to emulate northern exposure window light.

coop See *chicken coop*.

core shadow The darkest portion of the shadow that forms on the unlighted side of an object.

correlated color temperature A term used to indicate an approximate visual match when a light source exhibits a discontinuous spectrum and is not comparable to a *black body radiator* (as a *fluorescent lamp*). Correlated color temperature refers only to how the light appears to the adaptive eye; it does not take into account how the film *emulsion* or video *target* will respond to the given light.

cosine law A law of physics that states that the amount of light reflected from a surface decreases as the surface is angled away from the source and is proportional to the cosine of the *angle of incidence*—in other words, as the light hits the surface at more of an angle, the brightness of the surface will diminish. The cosine law derives from a geometrical formula that states that the cosine of a right triangle is the ratio of the side adjacent to a given angle to the hypotenuse.

cove (1) A tent of *duvetyne* over a window or doorway, used to create a nighttime effect. (2) A baseboard for a piece of background scenery that generally contains lights.

coverage Multiple shots of a scene taken from various camera angles, meant to augment the basic *master shot* and increase editing possibilities and options. To cover a scene is to give it a wide variety of shots.

covering When a performer inadvertently blocks another's light or the camera's view. The *director* will normally tell the perpetrator, "You're covering."

cover set An alternative indoor *set* to be used when inclement weather prevents the use of a primary exterior.

crabbing Side-to-side or angular camera movement.

crab dolly A small *dolly* with independently rotating locking wheels that allow tracking in any direction, including sideways (like a crab's movement).

crab shot A shot that includes a lateral movement from the side of the scene. In such a shot, the camera may move in a lateral or angular direction like a crab.

cracker smoke A special effects smoke generated by atomizing baby or cooking oil with compressed air or nitrogen. Cracker smoke is highly dense and hangs in the air for relatively long periods of time.

craft service The personnel responsible for providing coffee, beverages, snacks, and meals for cast and crew on a *set*.

Crank-O-Vator A heavy-duty rolling stand with a crank-operated elevating column ending in a 1-1/8" receiver, used for *HMI*s and other large fixtures weighing up to 150 pounds. Manufactured by *Matthews Studio Equipment, Inc.*

CRI See *color reversal internegative*.

cribbing Short 2" x 4" planks generally measuring 10" in length. Used to elevate, level, or stabilize wheels, casters, or legs of chairs, fixtures, or *props*.

cross key lighting An economical lighting configuration where two *key lights* are used to light two subjects and serve as *backlights* as well. Each light is set so that it keys one subject and backlights the other.

crosslight A type of light that rakes across the subject. Crosslight tends to be one of the most evocative types of lighting.

cross lighting Lighting that comes from the side of the *set* or scene.

crowder hanger A bracket consisting of a 1-1/8" receptacle welded to a flat angled hook that mounts conveniently on a 2" x 4" set wall stud. The receptacle will accept a special L-shaped piece with a 5/8" pin on either end for hanging smaller fixtures. The crowder hanger is the safest means of attaching light fixtures to lumber. Also called crowder clamp. See figure C.6.

CSI lamp Compact source iodide *lamp*. An *enclosed arc discharge* lamp similar to the *HMI*, with a *correlated color temperature* of 4,400 degrees *K*.

C-stand See *Century stand*.

CTB (Color Temperature Blue) A blue *filter* for increasing the *color temperature* of a source in varying amounts; for example, a full CTB increases the color temperature of transmitted *tungsten* light



Figure C.6 Crowder hanger. Courtesy of Matthews Studio Equipment, Inc.

from 3,200 degrees *K* to 5,500 degrees *K*. Equivalent to *Wratten Series 80* filters. See also *tough blue*.

CTO (Color Temperature Orange) An orange or amber *filter* for decreasing the *color temperature* of a source in varying amounts; for example, a full CTO lowers the color temperature of transmitted *tungsten* light from 5,500 degrees *K* to 3,200 degrees *K*. Equivalent to *Wratten Series 85* filters.

cukaloris An *opaque* sheet perforated with irregular holes, used as a *gobo* to create a mottled pattern on a subject or to break up the monotony of an even-colored background. See figure C.7.

cup block A 5-1/2" x 5-1/2" square wooden block with a bowl-like depression in the top, which fits under the wheels of a rolling stand to keep it from rolling away.

current The flow of electricity through a *circuit*, measured in *amperes*.

cut, to (verb) (1) To remove light from a scene. (2) Command given by the *director* to stop the *action* in a scene.

cutter A long narrow *flag*, used for blocking light from the camera or an area of the *set*.

cyan One of the *subtractive primaries*, a mixture of blue and green; the complement of red.

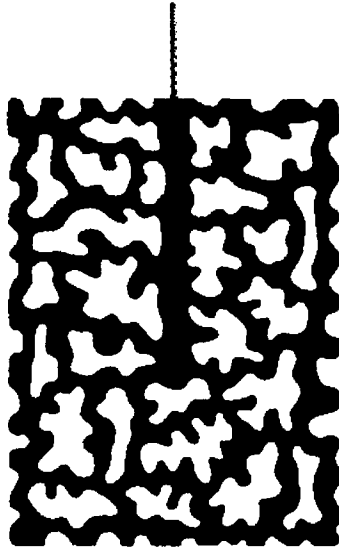


Figure C.7 A *cukaloris*, or cookie

cyc light One of several lighting instruments specially designed to illuminate a *cyclorama*. See also *strip light*.

cyclorama, or cyc A large smooth curving *backdrop* used in *studios* and *sound stages* to create a sky or *limbo effect*.

cyc strip A troughlike bank of *open-faced* fixtures, placed on the ground along the bottom of a *cyclorama* to provide even background *illumination*.



dailies Prints of the previous day's shooting, so named because they are retrieved from the lab and screened each day. Dailies are usually one-light prints, that is, printed without the usual scene-to-scene *color correction* reserved for *answer prints*; this allows the *director of photography* to judge the lighting and *color balance*. Synced dailies are one-light prints with accompanying synchronous sound magnetic film tracks. When the editor begins to cut the various scenes together, this film becomes the workprint. Also called *rushes*.

dance floor A *studio* floor built of 3/4" plywood and topped with a layer of hardboard to provide a smooth surface for *tracking*.

day-for-night A method of simulating nighttime by shooting exterior scenes during the day, when actual nighttime photography is not practical. A convincing day-for-night effect is achieved by *under-exposure*, use of *filters*, shooting on sunny days in late afternoon or early morning and excluding the bright sky as much as possible. Many early westerns were shot using this technique.

daylight Normal outdoor light, a combination of light emanating from the combination of sun and sky, that has roughly a *color temperature* of from 5,500 to 6,000 degrees *K*.

daylight spool A small black film reel with solid flanges that allows loading into a camera under subdued light. Daylight spools generally come with 100' film loads for use in small 16mm silent cameras such as the Bolex Rex.

dc See *direct current*.

decamired A unit of measure for *color temperature*, one tenth of one mired. See also *mired*.

decibel (dB) A unit for measuring *voltage*, used in particular for measuring the amplitude of a video or audio signal. *Gain* in video sig-

nals is measured in decibels—a 6 dB increase in signal gain means a doubling of signal volume. See also *gain*.

deck pole An extension arm, with a sliding 2-1/2" *grip head*, that fits on a 1-1/8" peg protruding from a *catwalk*, creating a horizontal pole with a 180 degree arc.

deep focus A technique using *fast wide-angle lenses* and fast film to preserve as much *depth of field* as possible in cinematography, to capture nearly all picture planes in sharp focus. Deep focus was popularized by *cinematographer* Gregg Toland in the film *Citizen Kane*.

definition The degree of sharpness in an image, and fidelity with which the detail of a scene can be reproduced by the camera on film. Also known as resolution.

degradation The degree to which the quality of the film image is inferior or degraded, compared to the original scene or the film image at some earlier point. Degradation of an image occurs with each successive generation of a print in any analog reproducing process.

densitometer An instrument used to determine the *density* of a film negative or print, usually a photoelectric device that measures the light transmitted by the image.

density The degree of opacity in a film image, affected by numerous factors including type of film *emulsion*, lens, *exposure*, and processing time.

density range The continuum of tones that a film is capable of reproducing, as manifested in the variable density of the film's grain.

depth of field The area of apparent *focus* that extends before and behind the point of actual focus of a lens; the area in which *circles of confusion* are rendered small enough to register as points in the image. The area of depth of field generally extends one-third of its depth ahead and two-thirds behind the plane of primary focus. Depth of field is affected by the *focal length* of the lens, the size of the selected *aperture*, and distance between the primary plane of focus and the lens. Many *prime lenses* feature a depth of field chart inscribed on the lens barrel. It is also possible to derive depth of field information for a given situation by consulting depth of field charts published in the *American Cinematographer Manual* and other references. The technique of *deep focus* is dependent on a wide depth of field. See also *circle of confusion*.

depth of focus The range of *focal planes* behind the lens at the *film plane* where an image will register in *focus*. Often confused with depth of field.

desaturation A decrease in a color's richness; in *film stocks*, an effect often caused by *overexposure*, *fogging*, post-flashing, lighting, smoke, aging, or processing. Often, desaturated colors are deliberately induced for effect: In the film *McCabe and Mrs. Miller* (Robert Altman, 1972), colors are desaturated by deliberately aging and stressing the wooden structures of the Northwest mining town, and the predominant brown *bues* are muted further through *flashing*.

desert dolly A three-wheeled *dolly* with oversized pneumatic tires, used for rolling a heavy fixture and stand over rough or sandy terrain. See figure D.1.

deuce A 2,000 *watt spotlight*, also known as a *2K*. A 1,500 watt *lamp* in a deuce housing is known as a "light deuce" or "one-and-a-half"; a 1,000 watt lamp in a deuce housing is sometimes called a "gutless deuce."

diaphragm The *iris* of a lens, which controls the amount of light that passes through by means of an adjustable radial series of thin metal blades. The size of the diaphragm's *aperture* is controlled by the *f-stop* ring located on the lens barrel.

dichroic filter A *filter* that reflects certain light wavelengths while transmitting others. Dichroic filters are often used with *tungsten-halogen lamps* for *daylight* shooting.

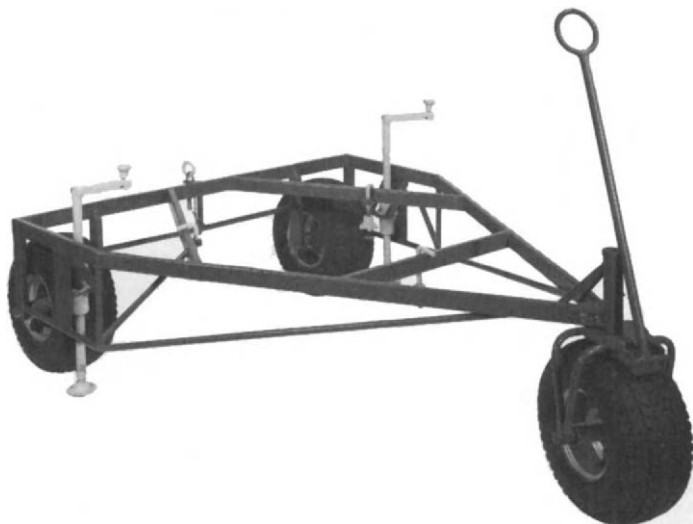


Figure D.1 Desert dolly. Courtesy of the Mole Richardson Company.

dichroic lamp A *globe* that features a built-in conversion *filter* for converting *tungsten* to *daylight* balance. A *PAR-FAY* is one type of dichroic lamp.

diffraction The light phenomenon exhibited by wave fronts that, passing the edge of an *opaque* body, are modulated, resulting in a redistribution of energy. Diffraction becomes apparent in light by the presence of closely spaced dark and light bands at the edge of a shadow, and, sometimes, fringes of spectral *hue*. The rainbow colors reflecting from the surface of a compact or laser disc are the result of diffraction.

diffuser See *diffusion filter*.

diffusion (1) A phenomenon that occurs when light is scattered, as when it is filtered through a *translucent* medium or reflects from a *matte* surface. (2) Translucent materials that soften *highlights* and shadows, reduce *contrast*, and increase the size of a source.

diffusion filter A *filter* incorporating an irregular surface or screen to scatter and soften light passing through.

diffusion frame A rectangular or circular holder for *diffusion* or color *gel filters*, which fits in the brackets of a lighting fixture.

dimmer A *rheostat* or other device that reduces or increases the flow of electricity to a light or bank of lights, thereby turning up or down the *intensity* of *illumination*. Dimmers that operate in this way are of limited use with color films as they affect the *color temperature* of the *lamps*. See also *variac*.

dingle A tree branch placed in front of a light source to cast shadows of foliage and tree limbs; an improvised *cukaloris*. Also called a *branchaloris* or *smilex*.

dinky A small *enclosed-housing fixture* that holds a 100 *watt lamp*.

DIN number A European standard of measurement used for designating *exposure index*. The DIN (for Deutsche Industrie Norm) is usually expressed as the second part of the now universally used *ISO* number. For example, an *ISO 100/21* film has an *ASA* of 100 and a DIN of 21.

diorama A small *set* used in place of a much larger one.

direct current (dc) Electrical *current* that flows continuously in one direction only, as opposed to *alternating current (ac)*. Certain sources such as *Brutes* (*carbon arc lamps*) require dc in order to operate.

directional light Hard light that strikes in a beam of cohesive parallel rays from one or a very few angles. A *spotlight* is a typical source of directional light.

director The chief creative member of a production, responsible for the vision and final realization of a motion picture.

director of photography, or DP The person responsible for capturing the image on film or video. The DP is responsible for (1) the lighting of the *set* or location, (2) the general composition of the scene, (3) the colors of the images, (4) the choice of cameras, lenses, *filters*, and *film stock*, and (5) the setting, *setups*, and movements of the camera. Since the DP is responsible as well for maintaining an overall style and consistent balance of color and lighting, the operation of the camera itself is often handled by a second camera person.

director's viewfinder A *variable focal-length lens* especially designed for previewing a scene to aid in determining camera position. A scale on the finder barrel allows the *director* or *cinematographer* to find the desired *focal length* lens for a shot. The director's viewfinder has a lavalier-type chain or cord so it can be worn around the neck.

discharge lamp A type of *lamp* in which light is produced by an electrical discharge in a gas-filled enclosure. *HMI*s and *mercury-vapor lamps* are discharge lamps.

discharger A device used for completely draining stored electricity from *NiCad batteries* before recharging. Periodic complete discharging will counteract the *memory effect* and increase the usable life span of the batteries.

Desisti An Italian manufacturer of lighting equipment for film and television production.

dispersion The separation of light into its various colors by refraction through a transparent medium such as a *prism*.

distribution box A box used for centralizing electricity for distribution on a *set*.

distro box See *distribution box*.

ditty bag A small leather or cloth bag that holds various accessories such as *gaffer tape*, tools, *light meters*, *grip clips*, *C-47s*, and other articles, generally worn by *grips*.

D log E curve A *characteristic curve* plotted on a graph, depicting the relationship between a film's *exposure* time and *image density*.

D max The highest point of *density* that an exposed film can achieve, represented as the *shoulder* or *knee* on a *characteristic curve*.

D min Another term for *base-plus-fog density*. The minimum *density* for unexposed film, which depends on the translucency of the base material plus any inherent *fogging* in the *emulsion*.

dolly A wheeled platform or mobile apparatus that supports a camera, operator, and often a camera assistant. Dollies are used for moving camera shots and often glide noiselessly on specially laid tracks. The camera is mounted on a *pedestal*, *jib*, or *boom* that allows other complex movements as well. Dollies that can roll to either side as well as backwards and forwards are called *crab dollies*.

dolly grip An assistant whose job is to push the camera *dolly*.

dollying A camera movement executed with a *dolly*; also known as *tracking*.

dolly shot A shot taken with the camera moving on a wheeled conveyance.

dolly tracks Metal tracks on which a camera *dolly* is positioned and moved in order to facilitate the smooth and fluid movement of the camera while shooting.

donut A large washer placed over a *lamp* or projector lens, used to *stop down* the light and focus rays into a tighter beam; also, a collar that fits around the barrel of a lens to prevent *flares* from the light that reflects back from the *matte box*.

donut effect A hot or dim spot that forms in the center of a *lamp's* projected beam, which often appears when *open-faced* instruments are focused or defocused.

doorway dolly A simple *dolly* consisting of a platform and four pneumatic tire wheels (two of them steerable). So called because its relatively compact size allows it to pass through doorways. The doorway dolly, which requires the camera to be mounted on a *tripod*, is also used as a cart for transporting heavy equipment. The dolly also makes a convenient transport vehicle for camera cases, lighting fixtures, cable, and equipment.

Pneumatic rubber tires are standard on the dolly, but special wheels may also be installed for use on straight *dolly tracks*. Traditionally, the dolly was steered by a single-pull handle similar to a toy wagon, but a new steering feature has been added that allows the operator to steer from on board the dolly by inserting the pull handle through the push bar on the dolly front. Another innovation is an angled fitting to allow the bar to tilt down 34 degrees for more clearance between the dolly and dolly operator.

The basic dolly configuration consists of a wooden platform attached to a steel tubing frame. The platform is fitted with a recessed camera tie-down and is carpeted for a nonslip, low-maintenance surface. For extra-low angle shots, the dolly can be inverted, thereby positioning the platform closer to the ground. The dolly also includes the ability to extend the rear wheels outward in order to provide greater operating stability. See figure D.2.

dot A small disc-shaped *flag*. A dot, like a *finger*, functions in much the same way as a *scrim*. While a scrim is used to cut the *intensity* of a fixture, however, a dot is inserted into a beam of light to alter a small portion of the light rays. Dots are often used to bring down an isolated bright *highlight* or “*hot spot*” (such as a *specular highlight* from a metallic surface) within a scene. A dot features a long stem that may be affixed to a *grip head*, *articulated arm*, or *goose-neck*.

double A *net* or *scrim* with a second layer of mesh; doubles pass about 25 percent of the light transmitted through them, a two-stop cut.

double broad A large rectangular *open-faced* lighting instrument that contains two 2,000 *watt lamps*, generally used for lighting backgrounds and as a *fill light*.

double-faced tape A tape that has two adhesive sides, commonly available in two forms: (1) A 1/8"-thick spongelike foam-based

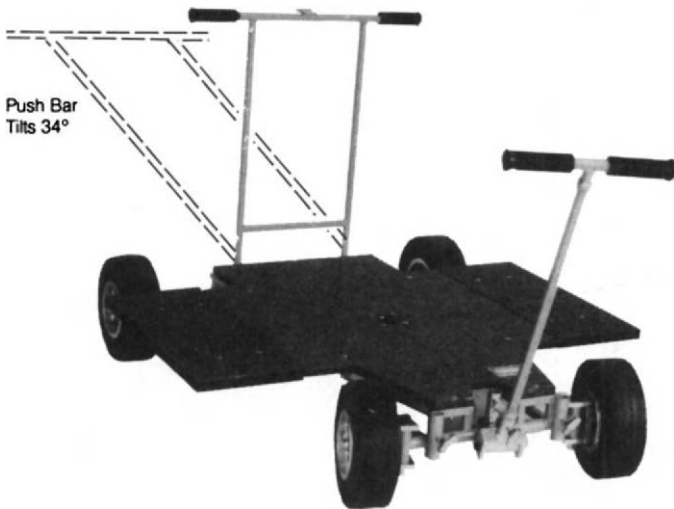


Figure D.2 Doorway dolly. Courtesy of Matthews Studio Equipment, Inc.

tape, and (2) A thin cellophane tape, sometimes called *carpet tack tape*.

double header An extension arm that converts a single 5/8" or 1-1/8" receiver to a double mount. The mounts are double-ended so that inverted light *yokes* or *gobo arms* may be affixed, allowing up to four fixtures to mount on the piece.

double key lighting See *cross key lighting*.

double Matth gag A 1/4" shaft with two independent *grip heads* opposite one another; used to gang two separate *nets* together. Also called a *lollipop*.

double scrim A wire grid dimmer disc having two layers of mesh; the double scrim attenuates a light beam twice as much as a single *scrim*.

douser A device for cutting the beam of a fixture internally without actually extinguishing the source. Dousers are a standard feature of *follow spot lights*.

downlight A beam of light focused on a subject from above.

DP See *director of photography*.

DP light An inexpensive *compact open-faced lamp* manufactured by Lowel Lighting, Inc., widely used in small video and ENG production. Lowel offers a wide assortment of accessories for the DP, including *snoots*, *barndoors*, snap-on *flags*, *gel* holders, *dichroic filters*, and *umbrella reflectors* to provide soft light.

drapery department The individuals responsible for curtains, draperies, furniture upholstery, canvas *backdrops*, and other related articles used on a *set*.

dressings Furniture, *props*, curtains, drapes, framed art work, statues, plants, extras, and any other subjects that embellish a *set* and create an air of authenticity.

drift (1) The unintentional movement of an actor or subject out of the intended *blocking* of a scene. (2) A *screen direction* for a character to slowly move in a given direction.

drop A large, heavy canvas curtain or *flat* suspended at the back of a *set* behind the *props* and actors, upon which background scenery is painted.

drop ceiling hanger See *scissor clamp*.

dry ice generator A box or container in which dry ice is released into hot water, used for generating a thick *fog* that hugs the ground.

dry run A full dress *rehearsal* with camera and actors before the actual photography.

duct tape A heavy household silver-colored tape, sometimes used instead of *gaffer tape*. Duct tape does not have the holding power of gaffer tape and tends to leave a sticky residue when removed.

dulling spray An aerosol spray applied to highly reflective surfaces to cut down glare and *hot spots*.

Dutch angle A skewed camera angle, in which normally vertical and horizontal scene elements such as doorways, floors, and wall corners appear as diagonals. Dutch angles, achieved by tipping the camera to the right or left, are used to impart a sense of imbalance, danger, and uneasiness to a scene. Excellent examples of this effect can be seen in the films *The Third Man* (Carol Reed, 1949) and *Do the Right Thing* (Spike Lee, 1989).

duvetyne A heavy fire-retardant black fabric used for making *teasers*, *flags*, *solids*, and *cutters*. Duvetyne, which is supplied in 48" and 54" width rolls, is also used to black out windows, to conceal objects from view, and to control *spill light*.

dyke See *dichroic lamp*.



ear A flag set up on one side of a fixture to block *spill light*. Also called a *slider*.

Eastman color An integrated tripack color film used widely for motion pictures made in the U.S. and Europe. First introduced in 1954, the film rivaled and soon superseded the complex and costly three-strip Technicolor process. The *emulsion*, which at one time suffered from fugitive dyes and fading, has been dramatically improved since its introduction with the development of *tabular grain* and other innovations.

Eastman Kodak The largest and most important film manufacturer. Based in Rochester, N.Y., the company was founded by George Eastman in 1880 to make photography accessible to amateurs as well as professionals. With its preloaded box camera, called the Kodak (a term which had no meaning in any language), and complete processing services, Eastman's slogan became "You push the button, we do the rest." Eastman later collaborated with Thomas A. Edison to produce the first 35mm motion picture film, still the universal standard for motion picture production and exhibition. The company has since come to dominate the world in film manufacturing and has made inroads into electronic imaging and recording systems as well.

edge light See *backlight*.

Edison plug Common household electrical plug, which features two flat parallel blades. The grounded version, featuring a third cylindrical pin, is sometimes known as a *Tri-Edison* or "U-ground" parallel blade. See figure E.1 (page 52).

effective aperture The ratio of a lens' *focal length* to the diameter of its *aperture* as defined by the lens *iris*; expressed as an *f-stop* or *t-stop*.



Figure E.1 Edison plug

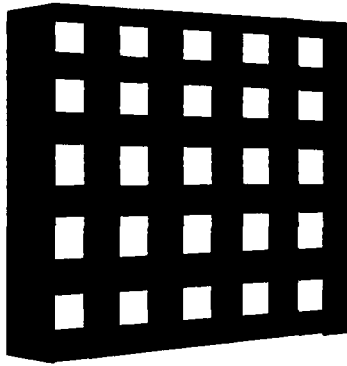


Figure E.2 An eggcrate

effects A term used to describe any illusory or artificial elements that do not occur naturally in a photographed scene.

effects light A light that *highlights* a certain detail in a scene. Effects lighting is often achieved with small *spotlights* such as *peppers* or *inkies*, which can be hung above the *set* to throw small *pools* on backgrounds or objects.

eggcrate A black sheet metal partitioned gridlike accessory that attaches to the front of a *softlight* to better direct its beam. See figure E.2.

EI See *exposure index*.

EIA gray scale See *chip chart*.

8K An 8,000 *watt* HMI fixture with a *Fresnel* lens.

electrical assistant A crew member who assists the *gaffer* and *electricians* by running cables, hanging fixtures, rigging lights, etc.

electrical crew The crew responsible for setting up and powering lighting instruments and related equipment, headed by the *gaffer*.

electric department The production group responsible for electrical work on a shoot, especially setting up and rigging lights and supplying *current* as well as maintaining all electrical equipment such as *generators* and *distribution boxes*. The chief *electrician* is known as the *gaffer*, and the first assistant is called the *second electric*, or *best boy*.

electrician One of the *electric department* or lighting crew, responsible for rigging and powering the lighting on a *set*. The electricians report to the *second electric*, who takes orders from the *gaffer*.

electromagnetic spectrum The entire spectrum, a continuum that includes visible light, *ultraviolet* light, *infrared* rays, gamma and x rays, radio waves, and alternating electrical *current*. The radiant energy of the spectrum is classified according to wavelength, or the distance between successive waves. The shortest wavelengths, the cosmic rays, are so small that there are billions of waves to the inch. The longest, electrical power waves, measure several miles in length. Physicists use the metric *nanometer*, or millimicron (one-thousandth of a millimeter), as the measurement of light wavelength. Energies of very long wavelength, such as radio waves, are generally measured by frequency of wave cycles-per-second, or *Hertz*. Wavelength in the visible spectrum is discernable to the eye as *hue*.

White light, with wavelengths measuring 400 to 700 nanometers, is actually the sum of hues in the visible spectrum. The *cool* hues (violet, blue, and green) are of short wavelength, while the *warm* hues (yellow, orange, and red) comprise the longer wavelengths. Invisible light of shorter wavelength than violet is known as ultraviolet; wavelengths longer than red, where heat occurs, are called infrared. Although the human eye cannot see ultraviolet and infrared radiation, photographic and video media are nonetheless sensitive to certain of these wavelengths. Film in particular is sensitive to heat, which occurs primarily in the infrared band. See figure E.3 (page 54).

electromotive force The energy available for conversion from non-electric to electric form, or vice versa; the potential difference between the terminals of a source of electrical energy, measured in *volts*.

electronic field production (EFP) A method of single-camera video production used extensively for producing high-quality dramatic programming. EFP uses many motion picture production techniques, as distinguished from multicamera television and *electronic news gathering* (ENG). British drama programs and most

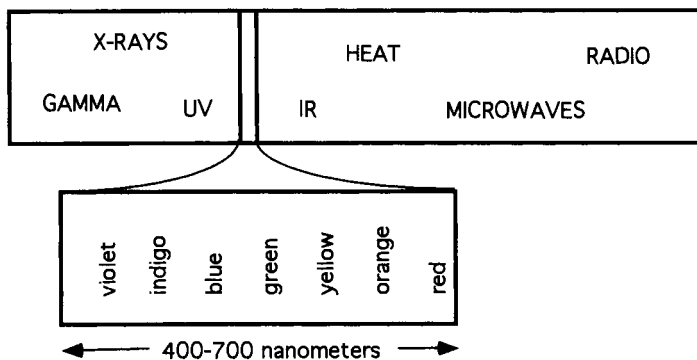


Figure E.3 The electromagnetic spectrum. Visible light comprises a very small portion of all radiant energy.

American soap operas are produced using EFP techniques. Electronic field production is expected to largely supplant film production as the quality production technique of choice, as higher definition television systems are adopted.

electronic news gathering A method of shooting and videotaping news events, interviews, and other informational programming. ENG is accomplished with lightweight portable video equipment and is similar in spirit to 16mm documentary filmmaking, which it has largely supplanted.

ellipsoidal fixture An *enclosed-housing fixture* that produces a hard, focussable beam of light. The ellipsoidal fixture, so called because of the shape of its *reflector*, contains one or two *plano-convex lenses*, thereby giving the ellipsoidal its characteristic long throw and ability to project a pattern on a given area.

The ellipsoidal housing contains four internal framing *shutters*, which can be adjusted to project a *pool* of light with hard, defined lines, such as a square or rectangle. The instrument's beam or projected pattern is focused by sliding the telescoping lens tube at the front of the fixture. Ellipsoidal fixtures, used primarily in theaters and sound stages, are somewhat heavy and unwieldy for location work. Having no on/off switches, they are usually mounted from overhead pipes or *grids*. The ellipsoidal is sometimes called a *Leko* light. See figure E.4.

Emily See *broad*.

emitter plate The optical glass pane inside the Arriflex *Varicon* camera *flashing* device. The emitter plate receives varying levels of low light, which reduces *contrast* in the photographed image.

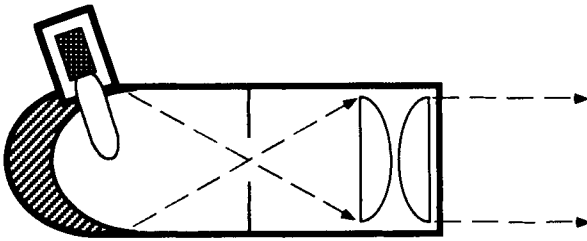


Figure E.4 Cross-section of an ellipsoidal fixture

emulsion The light sensitive layer of film, which contains *silver halide crystals* suspended in gelatin. The *latent image* is formed when the emulsion is exposed in the camera and made visible when the silver salts are transformed into metallic silver in developing. Color film has three emulsion layers, one for each of the primary colors.

emulsion batch An individual mix of *film stock* of a common *emulsion* makeup, formulated at the same time. Because each batch manufactured for the same film type may have slightly different *grain* structure and *color cast*, manufacturers generally number each roll of film in the batch for easy identification. Filmmakers often purchase their stock all at one time in order to ensure shot-to-shot consistency in the edited film.

enclosed-housing fixture A fixture featuring a *condenser* lens set in a cylindrical housing that completely surrounds the light source. Three *brackets* are attached to the housing in front of the lens to accept various *barndoors*, *scrims*, and *filters*. The box-shaped base of the housing contains the light socket and its *reflector* holder, both of which are attached to an external adjustment control. A power switch and cable complete the unit. *Fresnel spotlights* are enclosed-housing fixtures.

Enclosed housings contain cooling slots to vent heat from the lamp in its upright position. On most fixtures, the internal lamp may be accessed through a hinged door on the front of the unit. See figure E.5 (page 56).

envelope The glass or quartz glass “bulb” portion of any *lamp*.

expendables Any accessories that are used up or expended over a period of time, including *diffusion* material, colored *gels*, and tape.

exposure The act of allowing light to strike a film frame through a lens in a camera to create a *latent image* of the photographed scene on the film *emulsion*. The quality of an exposure is affected by the lighting in a scene, the amount of light admitted to the film by the

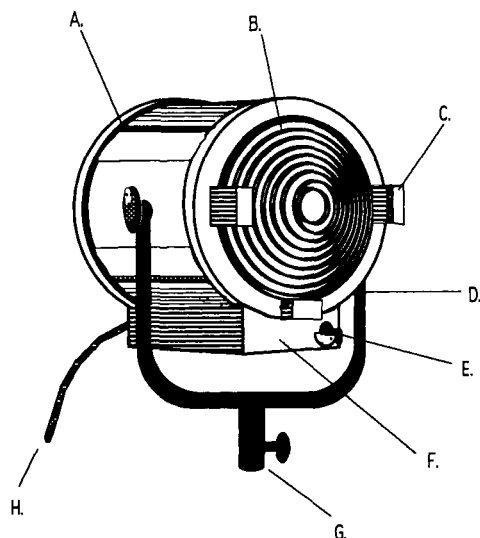


Figure E.5 A typical enclosed fixture incorporating cooling vents (A), a Fresnel lens (B), brackets for holding accessories (C), a yoke (D), a “rudder” for spot-flood focus adjustments (E), and underbox (F) containing lamp and *reflector* mechanism, a receptacle for mounting on a stand or C-clamp (G), and a power cable (H)

aperture of the lens *iris*, and the length of time that the exposure lasts, determined by the camera *shutter speed*.

exposure index (EI) A number designation for film sensitivity, required for determining *exposures* with a *light meter*. The EI number increases by two times as the light sensitivity of the film doubles. Therefore, a film with an EI of 200 is twice as light-sensitive, or *fast*, as an EI 100 film. The EI also relates directly to lens *f-stops* and camera *shutter speeds*. A film of EI 50 would require one f-stop more of light than an EI 100 *stock* under similar conditions. As the EI doubles numerically, the film is rated twice as sensitive, requiring half as much light. The term EI has been adopted by professional filmmakers and photographers to replace the older term *ASA*.

exposure meter See *light meter*.

exposure range See *latitude*.

EXR A registered trademark of *Eastman Kodak*, meaning *extended range*. The term EXR is used to identify a line of improved motion

picture films that employ a *tabular grain emulsion* to produce an extended sensitivity, *exposure range*, and *latitude*. The EXR emulsions include Eastman 5296 and 7296, among others.

extended range Denotes a special type of film that exhibits increased *latitude*.

extender A lens accessory that increases *focal length*. A 2x extender used with a 25–250mm *zoom* lens will yield a 50–500mm zoom.

extension A long electrical cable, used in power distribution.

extension tube A rigid cylinder that fits between the lens and the camera body, reducing the minimum focusing distance.

exterior (EXT) Any shot or scene that takes place outdoors, whether shot on location or in the *studio*.

exterior lighting Both natural and artificial lighting for exterior shoots.

eyelight A small barndoored or snooted *spotlight* mounted on or near the camera to give sparkle to the eyes and teeth of a subject.



fab tape A double-sided tape used for sticking *Griffolyn* sheets together.

facetone placement In the *zone system*, the portion of a film's *characteristic curve* where faces are placed for optimum *exposure*. In traditional photography, dark-complected faces are optimally rendered at zone 4, light brown faces at zone 5, and pale complexions at zone 6. See also *zone system*.

facial ratio The *lighting ratio* of a subject's face in *closeup*.

fall-off The diminishment of *illumination* at progressively greater distances from its source. Rapid fall-off creates sudden and severe shadows whereas gradual fall-off smooths out and softens the edges. Light falls off inversely to the square of the distance from the source to the subject. See also *inverse square law*.

FAST An acronym for "*focus, aperture, shutter, tachometer*," the four prime concerns of the *assistant camera person*.

fast (1) Extremely light sensitive; said of film *emulsions*. (2) Having a relatively wide maximum *aperture*; said of lenses.

FAY See *PAR-FAY*.

FC An abbreviation for *footcandles*.

FCM A tube-shaped, double-based *tungsten-halogen lamp*.

FCX A *PAR lamp* similar to a *FAY*, but balanced for *tungsten* light.

feather, to (verb) To move a *flag* or other *gobo* closer or farther from the source to vary the hardness of the shadow. Also refers to the ragged edge on one side of a *net*, *scrim*, or *silk*.

feeder cable A heavy *gauge* cable that carries electricity from the power source to the *distribution boxes*.

female Refers to a socket type connector, which must receive a *male* connector in order to complete a coupling in an electrical *circuit*

or in a joining of two pieces, such as a light head and a mounting pin.

fiber optic light unit A lighting unit used extensively in shooting automobile interiors and for special effects applications, including a *ballast*, 250 watt 5,600 K gas-discharge light box, connectors and cables and microlights consisting of a 2-1/2" *Fresnel* lens, a six-light bar, and extension lenses. The cables carry the light through flexible glass fibers and may be immersed in water or used in proximity to delicate subjects without harm.

fiddle The metal tubular loop attached to the light socket in many *practical* table lamps, which supports the lamp shade. Also called a *harp*.

filament An extremely thin, heat-resistant strand or coil of metal, usually *tungsten*, that resists electrical *current* and glows to create light (and heat) in an *incandescent lamp*.

fill light Any *softlight* that fills in areas of shadow cast by a *key light*, thereby decreasing image *contrast*. The fill light is frequently placed near the camera on the side opposite the key.

film noir A style of cinematography emphasizing the use of nighttime photography, high-*contrast* lighting, deep shadows, and oblique angles to create feelings of dread and anxiety. Film noir originates in American crime and mystery films of the 1940s.

film plane The plane where the film is held in the gate by the camera pressure plate where the image is focused and each frame is exposed. *Focus* is determined by measuring the distance from the subject to this film plane, the position of which is usually etched on the camera body as a circle bisected by a vertical line.

film stock Raw or unexposed film, generally purchased in bulk.

Film/Video Synchronizing Control A device, manufactured by Cinematography Electronics, Inc., that attaches to the side of a video monitor to sense its precise frame rate. The instrument is used to aid in photographing video *rasters* with Arriflex, Aaton, and Panavision cameras.

filter Any *translucent* material used to change the color or quality of light passing through it. Camera filters, made of optically clear glass or *gel*, are used in front of or behind the camera lens and affect the entire image. Light filters are used to alter a particular beam of light and allow more fine tuning and greater control.

filter factor The numerical compensation that must be factored into an *exposure* when a lens *filter* is used, to allow for light lost in *trans-*

mission. Filter factor is expressed as the number of times light must be increased in order to obtain the proper exposure. For example, a filter factor of four would necessitate opening up the lens *aperture* two *stops*, allowing four times more light to enter the lens. Filter factor pertains primarily to colored filters and does not apply to clear filters such as *UV*, *diffusion*, *star*, and other filters.

finger A narrow, rectangular *net*, *silk*, or *flag* used for very fine adjustments in lighting.

first AC See *assistant cameraperson*, *first*.

flag A rectangular frame stretched with black fabric, designed to be mounted on a *C-stand* as a *gobo* for shaping or blocking a beam of light. A *cutter* is a longer, narrower flag that is usually used for larger lighting units or when it is necessary to position the flag farther from a light source. A very large flag is called a *solid*. See figure F.1.

flag box A two-handled, wheeled box with dividers to hold 18" x 24" *flags*. The flag box protects the fragile fabric flags and *nets* when they are being transported or stored.

flag clamp A rugged clamp for hanging *flags* or large *scrims* from *overheads*. It features a locking mechanism and a riser that extends 6" from the casting and rotates 360 degrees.

flare *Spill light* that enters the optical system of a camera, causing *specular highlights* and/or *fogging*.

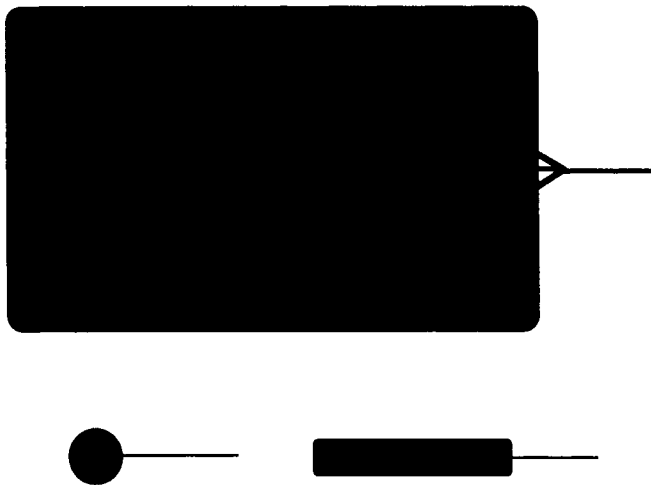


Figure F.1 A flag (top), dot (bottom left), and finger

flashing The laboratory technique of exposing film to a very low level of *illumination* after shooting in order to reduce *contrast* and desaturate colors. Flashed scenes exhibit soft desaturated colors and shimmering gossamerlike *highlights*. A popular technique in the 1970s (see *The Long Goodbye*, Robert Altman, 1973, for a prime example), in-lab flashing has passed out of vogue with the adoption of in-camera flashing units such as the *Lightflex* and the *Vari-con*. Also called *post-fogging*.

flat (1) A section of scenery consisting of a stretched canvas or panel on which a wall, landscape, or similar element of the background is painted. Flats fit together to form the background of a shot. (2) See *flat light*.

flat light Characterless, textureless light that casts very shallow shadows, often emanating from the direction of the camera/observer.

FLB A *color compensating filter* used to convert *cool white fluorescent* light to type B (3,200 K) *tungsten* film *emulsion*.

flesh tone The reflective value of human skin, as a reference for proper *exposure*. A pale Caucasian flesh tone reflects about 36 percent, while a dark-complected skin tone may reflect as little as 18 percent.

flex arm An *articulated arm* with a spring clamp on one end and a 1/4"-diameter receptacle on the other, used for holding *dots*, *fingers*, *French flags*, and other lightweight *scrims* and *gobos*. The articulated joints may be made more rigid by tightening the built-in thumbscrews. See figure F.2.



Figure F.2 Flex arm. Courtesy of Matthews Studio Equipment, Inc.

flex clamp A *grip clip* with a 1/4" shaft to fit into a *flex arm*. The flex clamp is useful for holding *gels*, small bounce cards, and other *gobos*.

flex frame (flex scrim) A small *flag* measuring 10" x 12" or 12" x 20" with two 1/4" mounting pins. The flex frame is designed to be used in conjunction with an *articulating arm (flex arms)*. They come in open end singles, open end doubles, and open *silks*, as well as closed end. They are used as *flags* and *dots*, where a larger will not work.

flicker The apparent strobing or intermittent flashing of *discharge* and *fluorescent lamps*, which are pegged to *ac* and oscillate 120 times per second. This effect, which can be quite pronounced in motion picture images, has been corrected in many newer lamp designs that feature a square-wave output and high-frequency oscillation.

floating wall See *wild wall*.

flood A large broad field of projected light that illuminates a large area, as opposed to *spot* lighting. Also, any *lamp* which produces this type of light.

floppy flag A *flag* consisting of a double layer of *duvetyne* folded back onto the frame and fastened with Velcro, which can be extended to double the area of the flag.

fluorescence The property of certain substances to absorb radiation of a particular wavelength and re-emit it as light of a different, usually greater, wavelength. Unlike phosphorescence, fluorescent *illumination* persists only as long as the stimulus remains active.

fluorescent lamp A tubular *lamp* wherein *alternating current* causes electrons to bombard mercury atoms, which in turn stimulate *phosphors* coating its *envelope* to emit visible light. Most fluorescent lamps emit light primarily in five wavelengths. See figure F.3.

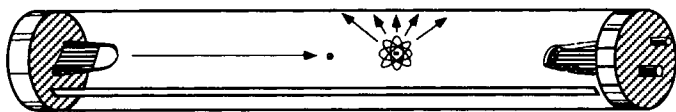


Figure F.3 A standard fluorescent lamp. Electrodes at either end of the tube heat up as current passes through, emitting free electrons. The electrons strike atoms of mercury vapor in the tube, causing the atoms to give off ultraviolet radiation. The UV rays in turn strike a phosphor coating on the inside of the tube, stimulating the phosphors to emit visible light. This conversion of one kind of light into another is called fluorescence.

flux The rate of light energy measured in *lumens* (*luminous flux*).

fly The high area above a *set* that contains various lighting instruments, and where scenery may be suspended; also known as "the flies."

fly, to (verb) To suspend in the air by means of cables or rope, as an *overhead silk*.

fly-away bag An empty canvas sack, which may be filled with sand or lead shot on arrival at the location. Fly-away bags are lighter and easier to transport and store than ordinary *sandbags*.

flying moon An open metal frame box containing two or four high-powered *HMI lamps* and covered with a diffusing material. It is suspended high above a *set* from a crane and is used to emulate intense moonlight in night exterior locations.

flying spot scanner A sophisticated film-to-video transfer apparatus popularized by Rank Cintel, which transfers from the original negative rather than from a film print, resulting in significantly higher quality than traditional telecine or "film chain" devices. The flying spot procedure reverses the polarity of the negative image and gives a full tonal range positive image in the video transfer. It also allows for scene-to-scene *color correction* in the same fashion as a timer would do in a film lab making an *answer print*. The process, though analogous to the *Hazeltine* process, is much more adaptable and offers a much greater range of corrections than the *Hazeltine* can perform.

foamcore A stiff card consisting of a 1/4"-thick layer of polystyrene sandwiched between two sheets of paper. Foamcore, which may have two white sides or one white and one black side, is widely used as a *reflector board*.

focal length (1) The distance from the optical center of a lens to the point where it brings into sharp *focus* an object placed at an infinite distance. (2) The length of a given lens, which governs its magnifying powers as well as the degree of its field of acceptance. A *wide-angle lens* is a short focal length lens, whereas a telephoto lens has a relatively long focal length.

focal plane See *film plane*.

focal spot A specially designed *snoot* with a lens at the end, which allows selection of several *apertures* and patterns that can be projected as sharp silhouettes, such as French window frames.

focus The point at which an image attains maximum *definiton*.

focus, to (verb) To vary a fixture's beam size and *intensity*.

focus puller See *camera assistant, first*.

focus range The ratio of *spot* to *flood* capabilities, said of a lighting fixture.

fog A thick smoke generated by fog machines or dry ice for special atmospheric effects. Also, the fluid used in such machines.

fog filter A special *filter* that diffuses and lowers *contrast* in an image to suggest fog or mist in a scene. Fog filters come in different grades, which affect image resolution and contrast in different ways.

fogging Photographic *density* appearing on film due to the effects of extraneous light or unwanted chemical reaction prior to the completion of processing.

fog level The photographic *density* of unexposed film after development.

follow focus A technique of adjusting a lens setting to ensure that the image is in sharp *focus* when the relative position of the camera and subject change during shooting. A procedure carried out by the *first AC*.

follow spot A large *arc* or *tungsten spotlight* used for throwing a hard circle of light on a stage performer. The follow spot is operated by a technician who trims the carbon rods (in an arc-type lamp) and maneuvers the instrument. The follow spot, which may house several *plano-convex* or *Fresnel* lenses, is used when a concentrated, hard circle of light is needed to follow a moving performer. *HMI*, *xenon*, or *carbon arc* light sources are generally employed to achieve a three- or four-hundred-foot throw. The follow spot is usually mounted on a heavy stand. All follow spots have a *shutter*, a *reflector*, a lens to focus the light, an on/off switch, a quick *focus* handle, an *iris*, and a front housing (called a *boomerang*), which contains a set of *filter* holders. There is also a *douser* for complete blackout of the beam.

footcandle A measurement of light *intensity*, based on the *luminous intensity* on the inside surface of a sphere with a one-foot radius from a light source of one *candela* or *standard candle*. A footcandle is equal to one *lumen* per square foot. While the footcandle is used widely in the U.S., most other countries use the *lux*, or *meter-candle*.

footlambert A unit of reflected light equal to the *luminance* of a surface emitting a *luminous flux* of one *lumen* per square foot, the

luminance of a perfectly reflecting surface receiving one *footcandle* of illumination.

forced processing A method of increasing a film's effective *speed*, achieved by lengthening developing time in the processing stage. Forced processing, which also increases *grain* and base *fogging*, is sometimes used to extend a film's light sensitivity when shooting in situations in which low light prevents *exposure* at the proper *exposure index*. Also known as pushing.

foreground plane The area physically nearest to the camera lens, occupying the lower portion of the frame. The foreground plane is frequently lit separately from the middle- and backgrounds. *Half-scrims* are also used to attenuate the great *intensity* of foreground light cast from a lighting fixture.

45 degree angle drop down A mounting adapter that inverts the 1-1/8" receiver and allows the unit to tilt or swing without interfering with the stand. This is useful when a situation requires that the fixture be lower than the top of the stand.

four-way A #1900 *utility box* with four *Edison* receptacles on a 10-gauge cable ending in a *male Edison* or a *half-stage plug*. See also *splitter*.

frame A *gobo* in the shape of a window sash, used to simulate window light.

French flag A small *opaque* shade used for shielding the camera lens from light *flares*. It is suspended by an *articulating arm* with spring tension ball joints ending in a screw-locking 3/4" diameter U-clamp.

frequency meter An instrument that measures the frequency of a *generator's ac* output to ensure that it conforms to specific tolerances. An *HMI lamp*, for example, may not tolerate anything greater than a quarter-cycle deviation from 60 Hz.

Fresnel A *lamp condenser*, named for its inventor French physicist Augustine Jean Fresnel, which features a recessed series of sloped concentric rings that collect and direct radiant light into parallel beams. The flat surface of the lens is also textured, slightly diffusing the transmitted light. Light transmitted through the Fresnel falls off gradually enough to allow for two *lamps* to blend softly in adjacent areas. The name Fresnel applies to any lamp utilizing such a lens.

fringing (1) An optical defect that appears as a breakdown in *definition* and color registration around the edges of an image, often seen in poorly executed *matte effects* in composite *process*

shots. (2) A spectral edge of dispersed color, a result of *chromatic aberration* in lenses. (3) A characteristic image registration defect of video systems utilizing edge enhancement circuitry; also called *ringing*.

Frisco pin See *stud adaptor*.

front lighting General flat and featureless lighting that emanates from the camera area or front of a *set*.

f-stop The measurement for calculating the opening of a lens *aperture* for determining *exposure*. F-stop numbers are derived by dividing the *focal length* of a lens by the diameter of its aperture. See also *t-stop*.

full blue A *CTB filter* that converts 3,200 K light to 5,500 K light. Full blue transmits approximately 36 percent of the light passing through it.

furniture clamp The furniture clamp is similar to a woodworking bar clamp, with the addition of a sliding thumbscrew bracket with 5/8" pin. The furniture clamp is adjusted by means of a ratchet-type spring release and notched bar. Fine adjustments are made with a worm screw handle.

When using a furniture clamp (bar clamp) on any surface, it is wise to use two pieces of 1" x 3" *cribbing* in order to distribute the great pressure that the clamp exerts on surfaces, to help prevent marring. See figure F.4.

furniture pad A heavy padded quilt, similar to a moving blanket, used for many production applications. Furniture pads are frequently used by sound recordists to dampen reverberations in a *set*. They are also used by camera crews to pad any hard surface for sitting,



Figure F.4 Furniture clamp with bar clamp adapter. Courtesy of Matthews Studio Equipment, Inc.

kneeling, or lying down while setting up and executing shots. They are frequently used to wrap and protect the delicate surfaces of existing furniture, floor, and walls. A feature of furniture pads is the metal grommets sewn at intervals around the edge of the fabric, which facilitate hanging the pads with nails along a wall.

fuse An electrical safety device that breaks a *circuit* when there is danger of overloading. A fuse generally consists of a metallic base or two contacts and contains a piece of metal that melts at a temperature far below the melting point of the circuit wiring. When a circuit is overloaded, the metal will melt and break the circuit. Fuses may be one of two kinds, *cartridge-type* or screw-mount, and are rated according to the *amperage* that they will allow. When a fuse blows, it must be replaced entirely to restore power in a circuit. In most instances, fuses have been replaced by *circuit breakers*.

G

gaffer The *chief lighting technician* in a film or video production crew. The gaffer supplies, places, operates, and maintains all *lamps*, fixtures, and power sources for *illumination*. The gaffer takes instructions from the *director of photography* (DP) and often has several *electrical assistants*. The gaffer's responsibilities include:

1. Scouting locations for potential lighting problems and possibilities and determining power availability.
2. Consultations with the director of photography and the production manager, preparing lighting and electrical order.
3. Consultations with *grips* about *rigging* lights in the *grid* or ceiling, rigging lights on moving car shots, *butterflies* and *silks*, and other considerations.
4. Directing the *electricians* regarding light placement, *diffusion* used, and *color correction* or manipulation needed.
5. Metering the scenes, directing *focus* and balance of *instruments*, spot/flooding, and adding or removing *scrims* or *dimmers*.
6. Directing grips in placement of *flags*, *nets*, *cutters*, and *diffusion frames*.
7. In some instances, metering the *exposure* of scenes.
8. Consultations with the director of photography, *camera operator*, and *ADs* about special conditions such as frame speed, *practical* monitors, *HMI* sync, and filtration.
9. Monitoring the scene for changing conditions during filming, including moving clouds and shifting sunlight.
10. Watching the *set* for potential trouble when the DP acts as camera operator.
11. Attending screenings of *dailies* and video transfer sessions if possible (or politically advisable).
See also *best boy*.

gaffer grip A multiple-use spring clamp resembling an oversized *alligator clip* bearing one or two 5/8" pins, used for quick mounting a

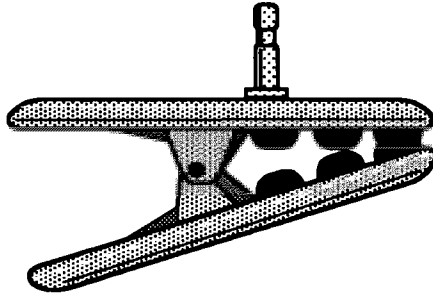


Figure G.1 Gaffer (gator) grip

small light fixture to a door, pipe, furniture or a light stand. The rubber-toothed adjustable jaws, especially handy for securing *foamcore*, provide normal and expanded mounting capabilities. Also called a *gator grip*. See figure G.1

gaffer, or grip, tape A tough 2"-wide cloth-backed tape. Similar in appearance to *duct tape* and used for securing cable, *plates*, and other lighting accessories. Usually gray, it is also available in other colors.

gain An adjustment that controls the *voltage* amplitude of the video signal in television cameras. It is possible to increase a camera's light sensitivity by "boosting" this gain. This is similar to *forced processing* ("pushing") in film. The intensity of a video signal is measured in *decibels* (dB), rather than *stops* as with film. Most video cameras are calibrated to have an effective *exposure index* of approximately 100. A 6 dB increase doubles the effective EI to 200, and a 12 dB increase gives an effective EI of 400. Increased gain, though increasing light sensitivity, results in a noisier picture. The problem of *noise* is compounded in postproduction and worsens with each successive generation.

gamma The degree of *contrast* in a negative or print, as measured on the angle of the straight line portion of the *D log E* curve. Mathematically, gamma equals difference in *density* divided by difference in *log E*. Theoretically, a gamma of 1.0 means the *film stock* faithfully reproduces the subject's *luminance range*, by providing a corresponding *density range* such that increments of density and increments of *log E* are equal.

gamma compression circuit A device for electronically creating a *shoulder* in a video camera by compressing two upper *zones* into one. This effectively extends the *log E* reproduction range of the

video image by one to five and a half zones. In this fashion, the gamma compression circuit allows the video image to approach a "film look."

gator grip See *gaffer grip*.

gauge The diameter of a wire or cable. The numbers increase as the diameter size decreases; thus, a 12-gauge cable is heavier than an 18-gauge wire.

gel A stiff transparent or *translucent* sheet *filter* of *acetate* or polyester, widely available in many colors and including *color balancing filters*, *color compensating filters*, and special color effects filters. Gels may be mounted in a frame or clipped to the *barndoors* of a fixture with *clothespins*. The term refers to frosted gelatin, a highly fragile material once used widely for *diffusion*, phased out in favor of the more durable plastics. Acetate is a stiff sheet material that should be used with cooler lensed fixtures or mounted on a *C-stand* with open-faced fixtures, or else heat will warp and melt it. Polyester sheeting has become very popular because of its high durability. Spun glass (*tough spun*) is also popular for diffusion. Although it will not burn, it may darken when placed too close to a fixture; another disadvantage is its skin-irritating fibers.

gel frame A thin sheet metal frame that sandwiches a *gel* or *diffusion* sheet and slides into the brackets at the front of a lensed fixture.

generator An internal combustion engine that drives a dynamo and creates electricity as for lighting and other applications. Generators provide a relatively safe, reliable power source and are available in sizes from eight *amp* motors up to 300 amp quiet tractor trailer units. See figure G.2.

genny Colloquial for *generator*.

ghost load A load of lighting instruments plugged into a *generator* solely to balance a load evenly over the *legs* of an electrical *circuit*. For example, in a three-phase system, if there are 100 *amps* on each leg, the *current* on the neutral will be zero, as the phases cancel each other out. However, if the system has 100 amps on one leg and nothing on the other legs, the current on the neutral will be 10 amps. This creates the danger of overloading the neutral wire, which is never fused; this can result in *transformer* failure and serious damage. *Lamps* plugged in as a ghost load are often turned away from the action if they are not needed as *luminaires*; it is important, however, not to cover them or set them facing the ground, as this can damage the lamp and may also create a safety hazard.

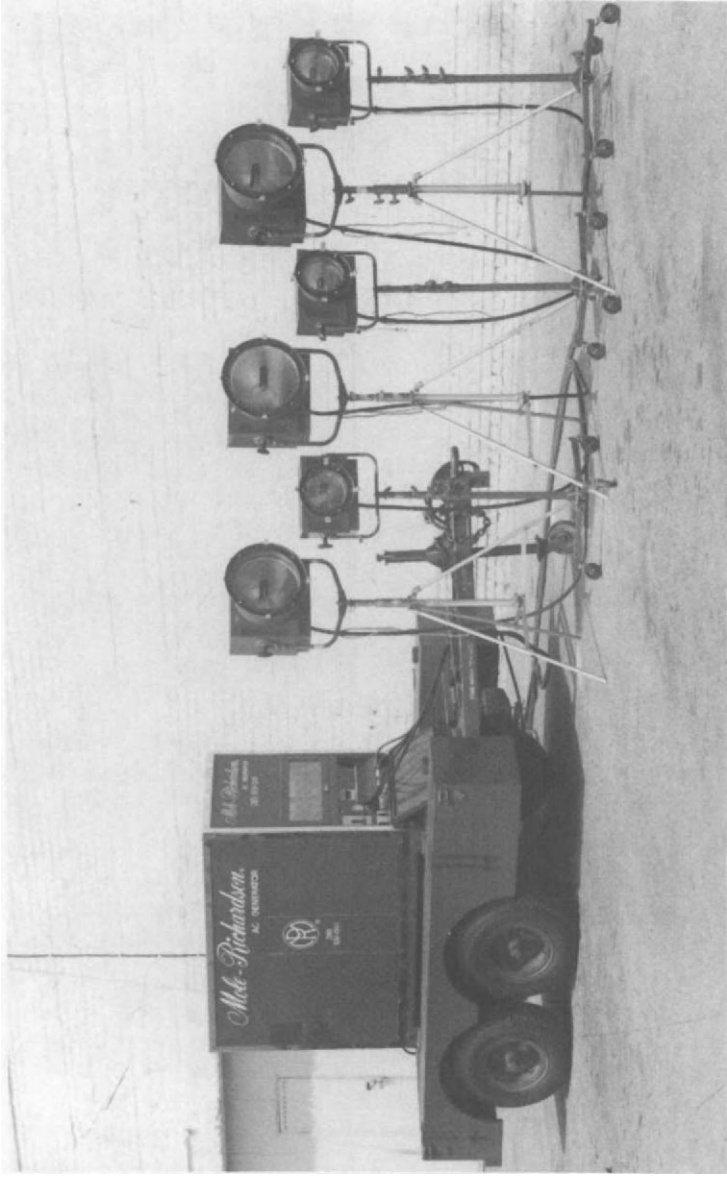


Figure G.2 200 amp generator. Courtesy of the Mole Richardson Company.

gigaHertz One million cycles per second.

gimmick bulb A small bulb, like the *REV globe* used in *inkies*; or a *peanut* bulb, used for hiding in confined spaces.

glare Light reflecting off shiny or *specular* surfaces.

globe A light bulb or *lamp*, whether spherical in shape or not.

glow light A very weak light source that creates a slight glow in the actor's face, usually directed onto the face from one side.

gobo Any lighting accessory that is used in front or inside of a *luminaire* to shape or alter the quality of the beam. Two commonly used gobos are the *flag* and the *cukaloris*.

gobo arm A 40" steel rod ending in a *gobo head*, used in conjunction with a *C-stand*. A *short arm* is a gobo arm that measures 20".

gobo head A connector with two pressure plates and grooved holes for 5/8", 1/2", 3/8", and 1/4" pins. It can hold a *grip arm*, a 5/8" fixture pin, any *gobo* pin, and tree branches, as well as clamp flat plates and *foamcore*, *show card*, and plywood. It mounts on the pin of a *C-stand* or light stand.

gooseneck A flexible tube that attaches with a clamp to the yoke of an instrument and holds a small *gobo* in the light beam to take down a *flare* or eliminate a *highlight*.

grad See *graduate*.

graduate A camera lens *filter* that modulates from a dense area to a clear area, used to darken skies and other areas for pictorial *effects*. A *graduated filter*.

graduated filter A *neutral density* (or other color, such as rose) *filter* that modulates gradually to clear glass or acrylic. They are used for dramatic sky darkening and find wide use in music videos, commercial spots, and feature films. Also called an *attenuator*.

grain The characteristic visual texture of a film image, created by clumping of exposed and developed *silver halide crystals*. Slow films generally have fine grain, while fast *emulsions* and pushed films exhibit coarser grain structure. *Tabular grain* is a recent innovation that features flatter halide crystals for greater resolution. Grain in film images is analogous to *noise* in video images.

gray card An 8" x 10" card with one *matte* gray side and one white surface. The gray side reflects 18 percent of the light striking it, representing an average of all reflective *values*, while the white side reflects approximately 90 percent of the light that strikes it. It is often used to take light readings using a *reflected light meter*.

gray scale The scale of continuous tonal *values* that a film or video target can “see”. Compare *chip chart* and *zone system*.

greens *Sound stage catwalks*, so called because they are often painted green.

grid (1) A lattice or grouping of several pipes, bars, or wooden studs fastened together and suspended from a ceiling above the *set* to support lighting fixtures. This can be as modest as a single *furniture clamp* for *rigging* lights, similar to a woodworking bar clamp, which is used to span doorways, rafters, and ceiling vaults. Instruments may be attached quickly with *C-clamps* or *mafer clamps*. A fixture may also be affixed directly to walls or ceilings with a *baby plate*, a plate with a 5/8" pin for mounting lightweight lighting instruments, which can be nailed or taped to a surface. *Polecats* or *pogo sticks*, spring-loaded telescoping poles that can be mounted horizontally or vertically in out-of-the-way areas, are another convenient way to mount lights in a limited space. A more elaborate grid may be constructed from aluminum conduit or from 2" x 3" fir studs in 8" lengths suspended near the ceiling. (2) A *ballast* for *carbon arc* lamps. The carbon arc grid acts as a giant resistor that limits *current* flow across the arc and regulates the *voltage* at 73 volts in order to prolong the life of the electrodes.

grid clamp A clamp that fastens tightly to a 1-1/4" or 1-1/2" diameter pipe. The *baby* grid clamp ends in a 5/8" pin, while the *junior* grid clamp terminates in a 1-1/8" *receiver*. When securely fastened, grip clamps are virtually unmovable. See figure G.3.

Grifflector A *Griffolyn reflector* sheet, in silver, gold, or silver and gold checkerboard on a white background.



Figure G.3 Grid clamp (junior). Courtesy of Matthews Studio Equipment, Inc.

Griffolyn A trade name for an extremely durable three-ply plastic sheeting. Griffolyn sheets come in 6' x 6', 12' x 12', and 20' x 20' sizes and are available in black and white, white and white, and clear configurations. They are usually stretched on frames and mounted on heavy stands.

grip A stagehand responsible for many tasks on a *set*. A grip may carry and set up equipment, *props*, and scenery, lay *dolly tracks*, and push the *dolly* during shooting. Grips usually do most of the *rigging* of light support equipment, mounting of the cameras, and stand by to ensure the safety of such equipment. Though grips are often jacks-of-all-trades, some do specialize in certain tasks, especially those related to camera dollies and rigging. On union productions, the grips are not allowed to touch *lamps* or electrical instruments or cables, which are the responsibility of the *electrical crew*.

grip-a-light A lightweight clamp that attaches to *lamp* sockets. The grip-a-light is available in 1-1/4" sizes for metal sockets and 1-1/2" for porcelain receivers and come with 3/8" and 5/8" pins. The clamp features rubber feet on its jaws to protect the surfaces to which it grips.

grip arm A rod with a *grip head* on one end, used in a *Century stand* to hold *gobos* in a wide variety of positions.

grip box A heavy-duty chest of drawers mounted on casters, loaded with common hardware and tools.

grip chain A lightweight chain used for lashing light stands to platforms, securing *grid* pipes, and other applications. Also called *sash chain*.

grip clip A versatile clip resembling a large metal *clothespin*. Grip clips are classified numerically according to size.

grip/electrical stage box A heavy-duty chest of drawers that rolls on a detachable metal caster frame. The box is used to store common hardware such as bolts, nuts, wire, nails, and power tools.

grip equipment All gear normally handled and set up by *grips*, including all nonelectrical lighting equipment and accessories such as *C-stands*, clamps, ladders, *dollies*, and *reflector boards*.

grip head The main *gobo head* that mounts to the 5/8" pin of the *Century stand*, and receives *gobo arms*.

grip helper An accessory extendable bracket that allows a *net* or *flag* to attach to a heavy-duty stand, obviating the need for a separate *C-stand*. It has a mounting casting with a 1-1/8" pin that fits into

the stand *receiver* and a 1-1/8" receiver to accept the *spud* of a lighting fixture. The arm, which is fixed at a 45 degree angle, extends from three to six feet, rotates 360 degrees, and accepts a single *gobo arm*.

gripology The science and craft of basic *grip* procedures, including the tools and equipment of grip work and general *set* operating methods. Gripology encompasses all modes of controlling the *intensity* and quality of light, including blocking, filtering, *feathering*, and attenuating techniques, and the use of equipment that is not connected to the light itself (which is the domain of the *electrical crew*).

grip stand See *Century stand*.

grip truck A van that carries an array of *grip* equipment for production.

grounding rod/spike A 24" hardened steel spike for electrical ground hook-ups and securing guide wires. Also called a *bull prick*.

ground line A *conductor* that runs from some part of an electrical *circuit* to the earth or a pipe or stake connected to the earth. In the event of a short, the ground line will carry the *current* safely to earth.

ground row A boxlike fixture that rests on the floor in banks, similar to a *cyc strip*. See figure G.4.

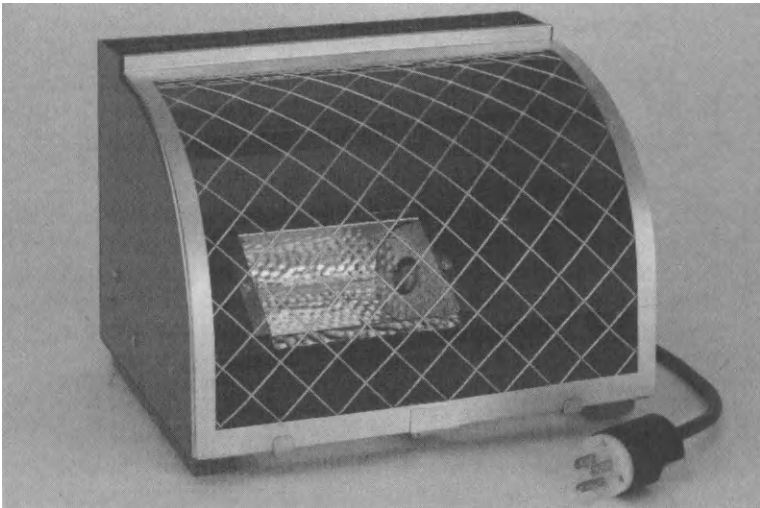


Figure G.4 Ground row. Courtesy of the Mole Richardson Company.



hair light A *separation light* that strikes the subject from behind and overhead, creating a *halo effect* on the head and shoulders. Hair lighting was common in films of the 1930s and 1940s and is still prevalent in much Hollywood-style filmmaking. With the trend toward greater realism in the 1960s and 1970s, it became more acceptable to dispense with *unmotivated* back lighting, especially hair lights. Nowadays it is generally up to the *director of photography* whether or not to use hair lighting.

halation (1) A *halo effect* that appears around bright *highlights* in a film image. (2) A ghost image caused by internal *reflections* in the film *emulsion*.

half broad A compact rectangular open-faced fixture that houses a 1,000 *watt lamp*, one half the power of a standard *broad*; used for lighting backgrounds and general fill work. See also *nook*.

half scrim A round flat metal *scrim* that has mesh on one half of the disc. The half scrim is useful for cutting light on foreground subjects while allowing full *illumination* on the middle- and *background planes*.

half-stage plug An older connector used in theatrical stages. Two half-stage plugs will fit into a standard stage plug receptacle. Also called a *paddle*. See also *stage plug*.

halo effect An undesired modulated glow of *illumination* around the contour of an image, usually caused by strong backlighting or by *halation* in the film *emulsion*.

halogen A class of elements including iodine, bromine, fluorine, and chlorine. Halogen gases (such as iodine) used in *tungsten lamps* are known as regenerative gases because they redeposit *boil-off* particles and prolong the life of the *filament*.

H & D curve A graphic representation of a film's *density*, *contrast*, and *exposure* characteristics. See also *characteristic curve*.

hanger A mounting accessory that fastens to a lighting *grid* and supports a lighting instrument.

hard light A relatively small, direct, and often focusable source that creates strong *highlights* and dense well-defined shadows.

hard side The mirrorlike shiny side of a *reflector board*.

hatchet lighting Unflattering lighting of a subject in *close-up* or portrait, where the *key light* illuminates one side harshly, splitting the face with a heavy dark line down the middle.

hat light A special light used in older films to fill in the shadow cast by the brim of a performer's hat; used to augment the *key light*.

haze filter A *UV filter* used over a camera lens to penetrate atmospheric haze by filtering out *ultraviolet* radiation.

Hazeltine An electronic color analyzer, named for its manufacturer. The Hazeltine displays a positive image onto a screen from a film negative to allow the lab timer to make adjustments in *density* and color for making a print.

HDTV A high-resolution video system that utilizes a 7:16 *aspect ratio* and a relatively high number of scanning lines.

header cable A cable that connects the *ballast* to the light head in an *HMI* fixture.

headroom Space in the frame above the subject's head.

herder A colloquialism that refers to the second *assistant director* (second AD), so called because the second AD usually has the responsibility of "herding" and controlling extras on the *set*.

Hertz A measurement for waveform frequency in cycles per second. Named for the German physicist Heinrich Hertz.

HID A high-*intensity* discharge *lamp*, a category that includes *HMIs*, *CIDs*, and *CSIs*.

highboy An *overhead* stand.

high contrast Steep *contrast* in an image between strong light and dark areas, with few or no intermediate *values*. Lighting of this type can create powerful, stark effects and can be seen in expressionistic films such as *Rumblefish* (Francis Ford Coppola, 1983) and *Stardust Memories* (Woody Allen, 1980).

high-contrast film A film that exhibits very few or no shades of gray, such as Kodalith. Also known as high-con, it is frequently used in the preparation of titles and special effects *matte* techniques.

high-key A type of lighting that emphasizes an overall bright effect, with predominantly middle gray to white *values*. A high-key scene is one that appears predominantly bright overall. High-key lighting can be seen in the paintings of Franz Hals and Hans Holbein and in most musicals and comedies produced before the 1970s. Most multicamera television programs taped before a live audience also use high-key lighting. This kind of lighting, which may be created with directional or diffused sources, features strong, even *illumination* on both subject and background, bright *highlights*, and relatively few shadows.

highlight An area of high *reflection* or *illumination*, generally recorded as a brilliant white area. Highlights are the lightest portions of a scene.

high-pressure sodium lamp A high-*intensity* discharge light source in which the light is primarily produced by the radiation from sodium vapor.

high-riser stand A light stand that elevates to heights of over twelve feet.

high-roller See *overhead stand*.

high-speed film (1) A highly light-sensitive film that can yield relatively good images under low light. Any film rated with an *EI* of 250 or over is considered a high-speed or *fast* film. (2) A film designed for shooting at speeds over 24 fps; such films have a slightly different sprocket hole pitch than a standard film.

HMI A metal hydrargyrum medium *arc*-length iodide *lamp*. The term HMI is now generic for any arc-type source enclosed in a low-pressure sealed glass *envelope* filled with various gases and elements. Originally introduced by Osram of Germany, the HMI represents the most important development in lighting in the last quarter century.

The great advantage of the HMI is its tremendous efficiency, which is usually expressed in *lumens* per *watt* of light. An Osram HMI 2,500 watt bulb can produce 240,000 lumens of light, compared to a standard 2,000 watt quartz bulb output of 50,000 lumens. This means that the HMI can provide roughly four times as much light for the same amount of power required.

Instead of a *filament*, the HMI incorporates a sealed arc within a bulb filled with mercury vapor and metal iodides. Furthermore, the HMI produces roughly half the heat generated by a similar *tung-*

sten lamp. Unlike the 3,200 degree *K* tungsten lamp, the HMI produces highly consistent 5,500 degree *K* *illumination*. Because of their high efficiency and *daylight* balance, HMIs are used frequently for exterior key and fill applications, largely supplanting the power-devouring *carbon arcs*. They are particularly useful for filling in shadows outdoors and for supplementing daylight in interiors, a much better alternative than filtering tungsten lamps.

Compact iodide daylight, or *CID lamps*, also provide 5,500 degree *K* illumination. Also available are compact source iodide or *CSI lamps*, which provide light at 4,200 degrees *K*, which is readily filterable to either tungsten or daylight. CID and CSI lamps, though popular in Europe, are not used widely in the U.S.

Metal iodide sources have some notable disadvantages. The HMI is a heavy piece of hardware; while the head itself weighs 60 pounds, the *ballast* adds an extra 145 pounds for a total of 205 pounds. The fixtures are also very expensive; a 2,500 watt lamp may well cost more than four 2,000 watt tungsten lamps. Like the *fluorescent lamp*, the HMI lamp pulses at a rate equal to double the *ac current* frequency (60 Hz in the U.S.), resulting in *flicker* at a rate of 120 times per second. While this is of no concern to the videographer, the *cinematographer* will find that if the motion picture camera *shutter* is not synchronized with the 60 Hz frequency, a noticeable strobing will appear in the footage. Synchronization between shutter and lamp must be an even multiple of the 60 Hz pulse rate; thus, the standard 180 degree shutter found in most cameras will not perform satisfactorily. The camera speed also must be kept constant, through crystal-sync or ac camera motors. These sync problems have been reduced by means of a reduced decay flux in the newer lamps. Thus, flicker can almost be eliminated.

HMIs require an ac power source and a heavy ballast unit to start the lamp and regulate the *voltage*. See figure H.1.

HMI PAR A sealed beam HMI lamp with a parabolic aluminized reflector.

Hollywood box An unfused electrical *distribution box* having two, four, or six pockets. The Hollywood box has short leads that end

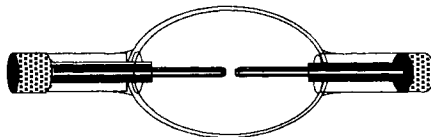


Figure H.1 An HMI lamp. Light is created when current arcs between the two electrodes.

in *Tweco*, slip pin, or *Camlock* connectors; they are handy for running a line to an area that doesn't need a full box.

honey wagon A trailer or vehicle that contains restroom facilities and dressing rooms for personnel for use during a location shoot.

Hopper, Edward. 1882-1967 American painter; born Nyack, N.Y. His work has influenced more *cinematographers* and *production designers* than has the work of any other American painter. His starkly realistic paintings of streets and houses, often without figures, have an atmosphere of loneliness and menacing melancholy. Of particular interest to filmmakers are his depictions of light. Interior lighting in his paintings appears motivated by sunlight that shines directly through windows to form hard rhomboid patterns on adjoining walls. This kind of lighting appears frequently in Hopper's paintings, but in the real world it occurs only for brief periods during the very early morning and very late afternoon (if there are no buildings or trees outside to block it). Despite this fact, contemporary films and television shows nearly always depict interior *daylight* scenes illuminated by steeply raking *crosslight*, because it is evocative and tends to *look* most realistic.

hot Lit too brightly; said of a *set*, *backdrop*, subject, or image.

hot lens A lens for a fixture that can narrow the beam while allowing a high-*intensity* light.

hot set A *set* in which further scenes will be shot, which must therefore not be broken down or tampered with.

hot spot A harsh bright *highlight* within a scene. Hot spots are often caused by *hard light reflections* from highly shiny surfaces and are generally unwanted. They can be taken down at the surface with *dulling spray* or shaded with a *dot* or *blade*.

household bulbs Standard *tungsten incandescent lamps* of relatively low power, ranging from 25 to 250 *watts*. They are subject to tungsten *boil-off* and tend to change *color temperature* as they age. They are the most common lamps found in the home.

household plug See *Edison plug*.

house lights The general overhead working lights in a *studio* exclusive of any *set* lights used in production.

Hubble plug An *Edison plug* or *male wist-lock* connector.

hue The essence of a color determined by spectral wavelength; *chroma*, as opposed to *value* or *saturation*.

hum A faint buzzing sound that emanates from certain fixtures that oscillate on *ac current*, including *fluorescent* and *HMI lamps*. This noise may cause problems if it is picked up by sound recording equipment. *Incandescent lamps* also may emit an unrelated type of hum.



illumination Light emanating from a source; *luminous intensity*. The term is also used to describe lighting that has no discernible craft or style: "That is not lighting—it's merely illumination."

image density (1) The degree of opacity in a film or video picture; the ability of an image to stop the *reflection* of light. Image density is affected by film *emulsion*, lens, *illumination*, length of *exposure*, and the developing process itself. *Specular* density is measured without regard to the diffused light transmitted by the image; *diffuse* density considers the *transmission* of all light. (2) Also, the amount of information in a particular image, or the number of individual elements that comprise the total picture.

imaginary line An axis line imagined to run through and bisect the line of *action* in a scene, used to keep consistent screen direction for smooth cutting continuity. Traditionally, the camera is not supposed to cross the imaginary line from shot to shot, in order to prevent jump cuts in the picture editing.

incandescence A process where light is produced when a substance such as *tungsten* becomes hot enough to glow. *Incandescent light* sources such as tungsten *lamps* produce great amounts of heat and are relatively inefficient compared with *fluorescent* or *arc* sources. Compare *fluorescence*.

incandescent lamp Any *lamp* that produces light when electrical *resistance* causes its *filament* to heat up and glow. Also, a standard incandescent *household bulb*.

incident light All light that falls on a subject, as opposed to any light that reflects from the subject itself, usually measured in *footcandles* or *lux*. The total footcandles of *illumination* falling on a given surface depend upon: (1) the *luminous intensity* of the source; (2) in the case of a *lamp*, the efficiency of the optical system used; (3) the distance between the source and the surface; (4) the *absorp-*

tion of the medium through which the light travels (whether air, haze, water, smoke, *filters*, etc.).

incident light meter A *light meter* that measures light illuminating a subject rather than light reflecting from the subject. The incident light meter is always recognizable by its round white plastic dome ("*lumsphere*" or "*photosphere*"), which acts as a three-dimensional light-gathering surface. The light-sensitive cell is located behind the dome and senses the total *intensity* of the light striking the dome.

The incident meter is used to measure light falling on a scene and is usually held at the subject position with the dome aimed at the camera lens. The dome is designed to simulate the shape of a person's face or other three-dimensional object within a scene. The advantage of this design is that the dome will automatically give a balanced reading of one or more light sources striking the subject. Thus, readings are integrated in a way that corresponds to relative light and dark portions of the three-dimensional subjects within a scene. The incident meter is often used for determining *exposure*; however, its most important feature is its usefulness in determining *lighting ratios*.

Popular incident meters include the "Spectra Pro" and the "Sekonic Studio Deluxe." The American-made Spectra has its calculator dial on the back of the meter, whereas the Japanese Sekonic has a dial on its front side. Despite their superficial differences, they work in basically the same way. A meter that recently has gained widespread popularity is the Minolta Flash Meter series, which features a micro-computer and LCD digital readout. Originally designed for photographers who use electronic flash, this meter is extremely useful for *cinematographers* for its direct frames-per-second and motion picture *shutter speed* readings.

In addition to the dome and disc attachments, incident meters may also be fitted with a round *filter* ("*lumitgrid*" or "*photomultiplier*"), changing the incident meter to a *reflective meter*. However, it is best to use a particular meter for the purpose for which it was expressly designed. See figure I.1 (page 84).

industrial lamps Any high-efficiency *discharge lamp* used for large area *illumination*. Industrial lamps are not suitable for film and video lighting because the light they produce does not contain a continuous spectrum. They include *mercury-vapor lamps*, *metal halide lamps*, and *sodium lamps*.

infrared An invisible form of light that includes heat. Infrared light has longer wavelengths than visible light, occupying the portion of the *electromagnetic spectrum* measuring 700 to 900 *nanometers*. Certain photographic films are infrared sensitive and can achieve

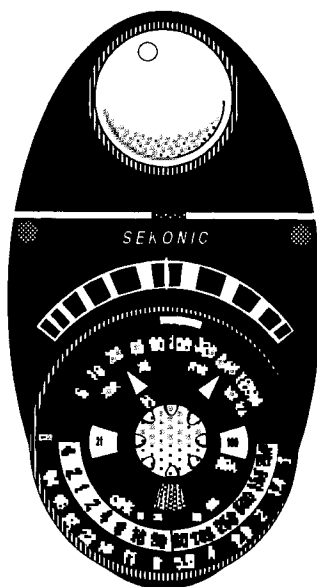


Figure I.1 Sekonic L-398 incident light meter

unusual effects, including shifted tonal renditions such as black skies and white foliage and skin tones.

inkie A small *Fresnel* or open-faced fixture of 250 *watts* or less. Inkies are small and light—they can be mounted on the camera, on *baby plates* or poles, or handheld—but can be surprisingly powerful at close range. They are often used as *eyelights* or to provide a finishing touch to a lighting plan. Also called an *inky-dink*.

inky-dink See *inkie*.

insert car A vehicle that carries camera, lighting, and *generator*, in addition to towing the *action car* during certain moving car shots.

instrument A lighting fixture.

insurance shot See *coverage*.

integral shot A *sequence shot*.

intensity The strength of a light source independent of the subject.
Luminous intensity.

interference A phenomenon of light that allows the cancellation of certain light frequencies in dichroic lenses in order to change the *color temperature* of transmitted light. The glass of the lens is

coated with a number of layers one quarter or one half the width of the wavelength of the color they are to filter. As that wavelength enters these layers it creates a series of interior *reflections* that cancel out the color.

inverse square law The law of physics that states that the light *intensity* of a radiating source is inversely proportional to the square of the distance between subject and the source, or $LI = 1/d^2$. See also *fall-off*.

inverter An electric device converting *direct current* to *alternating current*.

iodine An element of the *halogen* family, commonly used in gaseous form in *tungsten-halogen* and *HMI lamps*. Iodine is a regenerative element and contributes to lengthening lamp life by redepositing *boil-off* particles back on the *filament* in *tungsten* lamps and concentrating rare earth metals in the hot zone of the *arc* in HMI and other *discharge lamps*.

IRE unit A unit of video signal intensity, as measured on the waveform monitor screen. The screen is divided into 140 of these units; the video signal ranges from 0 to 100 IRE, while the sync information comprises the -40 to 0 range. The actual minimum *black level* is 7.5; maximum white is 100 units.

iris The adjustable diaphragm that controls the size of the *aperture* in a camera lens or in an *ellipsoidal fixture*. Also, the *matte*-type transitional wipe that masks off the picture into a tight circle of actual image area.

ISO An abbreviation for International Standards Organization. The designation ISO replaces the term *ASA* as used to denote a film's *exposure index*, and it also includes the *DIN* rating. See also *exposure index (EI)*.

Iwo Jima, to (verb) To place a heavy fixture by first mounting it on a stand lying flat on the ground and then raising it upright while holding the base steady with a free foot. This operation, named for the well-known photo and statue of American GIs planting a flag staff on a mound on the famous Pacific island, takes some practice and requires at least two *grips* to perform.

J

jacketed lamp A *tungsten-halogen lamp* that has a gas between the glass *filament* bulb and the outer glass housing. The gas protects metal seals on the bulb from oxidation, prolonging lamp life and allowing higher wattage.

jell See *gel*.

jenny An alternate spelling of *genny*. See *generator*.

jib A projecting arm or *boom* upon which a camera is mounted. Jibs may be placed in numerous positions and are capable of 360 degree rotations. Some popular camera jibs include the jimmy jib, the Louma crane, and the Barber baby boom.

juicer Slang for *electrician*.

jungle book A small booklet of *color balancing* and *color compensating filter* swatches, used in location lighting to determine filtration for various sources. Manufactured by *Rosco Laboratories, Inc.*

junior A 2,000 *watt Fresnel* fixture. The term also refers to the 1-1/8" mounting pin and receptacle size common to this and larger lighting fixtures, as opposed to the *baby* designation, which refers to all mounting receptacles and pins measuring 5/8".

junior pigeon A *pigeon* or mounting *plate* with a 1 1/8" mounting pin.

junior spud A 1-1/8" mounting pin that fits in the receptacle of a *junior stand*.

junior stand A light stand that accommodates a 1 1/8" *spud*, used for mounting 2000 *watt* and larger lighting fixtures.

justified camera movement Any camera movement that appears to be motivated by the *action*, i.e., *dolly*ing with a moving subject; as opposed to movement that appears for sake of style or changes in perspective.

K

K (1) An abbreviation for *Kelvin* degrees. (2) An abbreviation for 1,000 *watts*; used to describe the wattage of lighting instruments and *lamps*.

keg A *spotlight* with a 500 to 1,000 *watt lamp*; the instrument's housing has a shape reminiscent of a beer barrel.

Kelvin A scale for measuring very high temperatures including *color temperature*. It is based on the Celsius scale, but begins at absolute zero (-272 degrees C). The term Kelvin is often used interchangeably with *color temperature*. See also *color temperature*, *black body radiator*. See figure K.1.

key grip The person in charge of the stagehands, or *grips*. The key grip oversees all general grip work, which includes:

1. Keeping an accurate account of equipment used on the shoot.
2. *Rigging* all instruments hanging from the *grid* or from the *set*, including installation of *trapezes*, *trombones*, *hangers*, *scissor clamps*, *mafer clamps*, *baby plates*, and other like accessories.
3. Rigging lights to the *insert vehicle* or the *action car* for *running shots* and *car rigs*.
4. Setting of *flags*, *cutters*, *nets*, and *cookies*.
5. Rigging and adjusting *silks*, *butterflies*, and *overheads*.
6. Securing and leveling all tall stands with *wedges*, *apple boxes*,

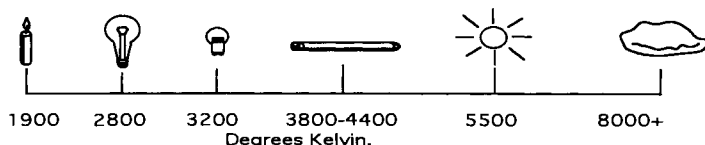


Figure K.1 The Kelvin scale and variation of color temperature in common light sources

and *step-ups*, placing all *sandbags*, tying down tall stands with *sash cords*, *grip chain*, or other line.

7. Placing *gels* or *diffusion* on windows, on *frames*—anywhere except on the lights themselves.
8. Any lifting or hoisting of heavy equipment.
9. Fetching and placing support equipment including ladders, lifts, cranes, and scaffolding.
10. Sheltering lights from inclement weather.
11. Working with *set* carpenters.

key light The primary light source in a scene, one which represents the motivating light source and establishes the perceived direction and character of the light. A traditional starting point for key light placement for *close-ups* is about 45 degrees left or right from the camera and from 30 to 45 degrees above the floor. The *cine-matographer* will more often put it elsewhere, however, depending on the mood and location of the scene.

Another rule of thumb dictates that the key light should come from outside the actor's look. In other words, if the actor is looking off-camera (usually the case in narrative films), the key should come from the other side of his line of sight so that he is looking between the key light and the camera.

kick (1) A bright light *reflection* that adds sparkle and life to a scene.
(2) A hard *edge light* on a subject as if from a *kicker*.

kicker A light to the side and rear of a subject, serving as an *edge* and *separation light*.

kill, to (verb) To extinguish a *lamp*.

kilowatt One thousand *watts*.

kilowatt hour (kwh) The measure of electrical usage from which electricity billing is determined. For example, a 100 *watt lamp* operated for 1,000 hours would consume 100 kilowatt hours (100 watts x 1,000 hours = 100 kwh). At a billing rate of \$0.10/kwh, this bulb would cost \$10.00 (100 kwh x \$0.10/kwh) to operate.

Klieg light A theatrical *carbon arc lamp*, formerly manufactured by Kliegl Brothers.

Kliegl stage plug system A configuration of plugs and sockets made by Kliegl Brothers for the distribution of electricity to nonmetal halide *lamps* of disparate wattage or *amperage*.

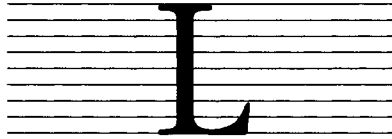
knee Another term for the *shoulder* of a *characteristic curve*.

knuckle A turnscrew on a *Century stand*, *combo/light stand*, or other large stand.

knuckle clamping disc head A unit comprised of two rounded discs with grooves for holding *flags*, *nets*, and accessories.

Kodak Slang for camera. "Set up a fill next to the Kodak."

KVA Kilovolt *amps*, a power rating for *generators*. One KVA equals 1,000 *watts*.



lamp The light source in a fixture.

lamp-life The number of hours at which 50 percent of all test *lamps* fail.

lamp operator A technician whose duties formerly included attending *carbon arc* lamps and manually trimming the carbon rods as they burnt down. The widespread adoption of automatic carbon arcs and *HMI* lamps in place of carbon arcs has obviated the need for such a technician.

latent image The invisible image formed in the *emulsion* of a film that has been exposed to light through the camera lens. This image remains invisible until developed and fixed in processing.

latitude (1) The range of *exposure* for a film that allows for a satisfactory image. (2) The range of light, from light to dark, that a particular film *emulsion* can record. (3) The range of time in developing that a particular film emulsion can record.

lavender A light violet-colored *net* that diffuses somewhat as it cuts the light of a source. A lavender cuts transmitted light by 15 percent. The handle and cloth covering on the edge are color coded with blue paint.

leaf grid The lattice formed by the overlapping of silver leaf squares on the soft-side surface of a shiny board *reflector*. A leaf grid acts to slightly scatter the light that reflects from it.

leg An electrical line.

Leko Another term for *ellipsoidal fixture*. A trade name of the Century Stage Lighting Company (now *Strand*).

lexan A tough, resilient, optically clear acrylic sheet material often used as a protective shield for the camera to shoot through when

photographing gunshots or explosions. It is available as 4' x 8' sheeting in several different thicknesses.

light The term generally applied to the radiant visible energy that emits from a source. Light is usually measured in *lumens* or candlepower. When light strikes a surface, it is either absorbed, reflected, or transmitted. Light, which exhibits both waveform and particulate characteristics, travels in straight lines through space at a speed of 186,282 miles per second.

light beam angle The angle of light emitted from a *luminaire* that is measured back to the source from the two points on each side of the beam where the *intensity* of *illumination* is half that of the peak point. These calculations are generally provided by the *lamp's* manufacturer and aid in determining the usable spread of light from the lamp. Also called *beam angle*.

light change points A series of *exposure* increases for altering the amount of light when printing a positive from a negative. These points, formerly calculated in logarithmic scales of $.05 \log E$, are now commonly figured in a scale of $.25 \log E$. Also called *printer points*.

light 'em out (verb) A command to fade out microphone shadows by rearranging the placement of the lighting instruments.

Lightflex A camera-mounted device that flashes a film image during actual photography to increase shadow detail and reduce *contrast*. The bulky Lightflex has been largely supplanted by the *Varicon*.

lighting director The person responsible for lighting video productions.

lighting grid An overhead lattice or pipelike structure to carry lighting fixtures and electrical connections.

lighting ratio The ratio of key to *fill light*, generally determined by comparing the fill light alone to the overlap of both *key lights* and fill lights. A high lighting ratio produces a high-contrast image. This balance of lights is adjusted according to the inherent contrast of the recording medium, contrast within the scene itself, relative size of the shot, and the effect desired by the *cinematographer*.

The first variable is the recording medium. All *film stocks* have distinct characteristics, whether negative, positive, black and white, or color. For instance, a reversal color film has less *latitude* and is more prone to contrast than a negative black-and-white stock. Video has even less latitude and little tolerance for high-contrast lighting situations.

The second variable is the inherent contrast of the scene itself.

Exterior and interior scenes can vary widely in colors and *values* of gray. In an interior location there may be dark furniture, white walls, and bright windows; in such a case, lighting ratios should be narrow for less contrast. The same applies when shooting a medium shot of a man in a white shirt and a black suit. This is why the brightness of the colors selected for the *set*, as well as the actors' clothing, should be controlled for photography. If all the objects within the scene are of controlled *reflectance*, then more dramatic lighting may be used without sacrificing too much detail.

The third variable is the relative size (and the respective shadow predominance) of the shot. In an exterior long shot, for example, dark shadows beneath a distant person's chin are of little consequence. However, if the person moves in closely and stops in *close-up*, the shadows become a predominant element in the scene.

The amount of fill light is adjusted to bring the shadows to the desirable exposure range. This lighting ratio is expressed as 2:1, 3:1, 4:1, and so forth. For example, a 2:1 ratio means that the fill light alone is one half as bright as the fill and key light together, a difference of one *f-stop*. See figure L.1

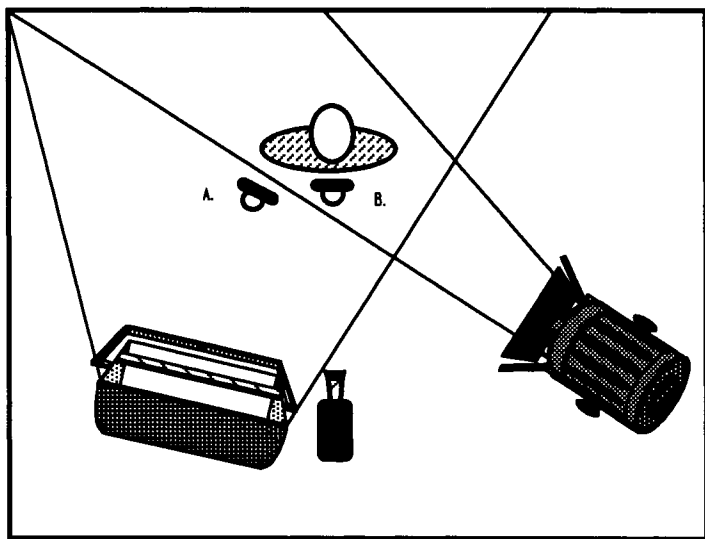


Figure L.1 Reading the lighting ratio. First read the fill light only by pointing the incident meter dome directly at the fill fixture; block any extraneous key light with your hand. Next hold the meter directly in front of the subject where the key and fill overlap and take a reading while pointing the dome at the camera. Compare the two readings; this is the lighting ratio.

light meter An instrument for measuring *reflected light* or *incident light* for determining camera *exposure* settings or reading *lighting ratios*. Modern light meter designs fall into four categories, with some models able to convert from one type to another with accessories:

1. Handheld *reflected light meters*
2. Reflected light *spot meters*
3. Through-the-lens reflected light meters
4. *Incident light meters*.

limbo effect An area of no defining characteristics, an effect often produced by a flatly illuminated *cyclorama* or *seamless paper backdrop*. The limbo effect is sometimes used to isolate and separate a subject from a featureless background.

linear perspective A system of perspective that creates an illusion of depth by utilizing lines in the composition that converge at one or more imaginary vanishing points on the horizon. Linear perspective in painting was perfected during the Renaissance. This type of perspective can be exploited and enhanced in photography through the use of *wide-angle lenses*.

lite lift A cranking stand with a *Rocky Mountain leg*, used for 4K HMI and smaller fixtures weighing less than 85 pounds.

loader See *assistant camera person, second*.

location An area used for shooting, or considered for use, other than a *studio*.

location kit A box of two, three, or four small portable lighting fixtures, with collapsible stands, *barndoors*, *scrims*, and *ac* cords, used for easy transporting into the field. See figure L.2 (page 94).

log E The logarithmic value of *exposure* and the scaling used on the horizontal exposure axis of film's *characteristic curve*. Both *zones* and *t-stops* relate simply to the log E axis of the characteristic curve where an increment of .3, the log of .2, is equivalent to a doubling of the exposure given, a doubling of the subject *luminance* value. Proceeding from zone 6 to zone 7 represents an increase of .3 on the log E scale.

lollipop A *double Matth gag*. See figure L.3 (page 95).

lose, to (verb) To remove (an object or *effect*) from the *set* or surrounding area, as in "lose the armchair."

low boy stand A low-profile *combo/light stand* often used as an umbrella stand. It was designed to be used in applications where standard combo/light stands cannot be used.

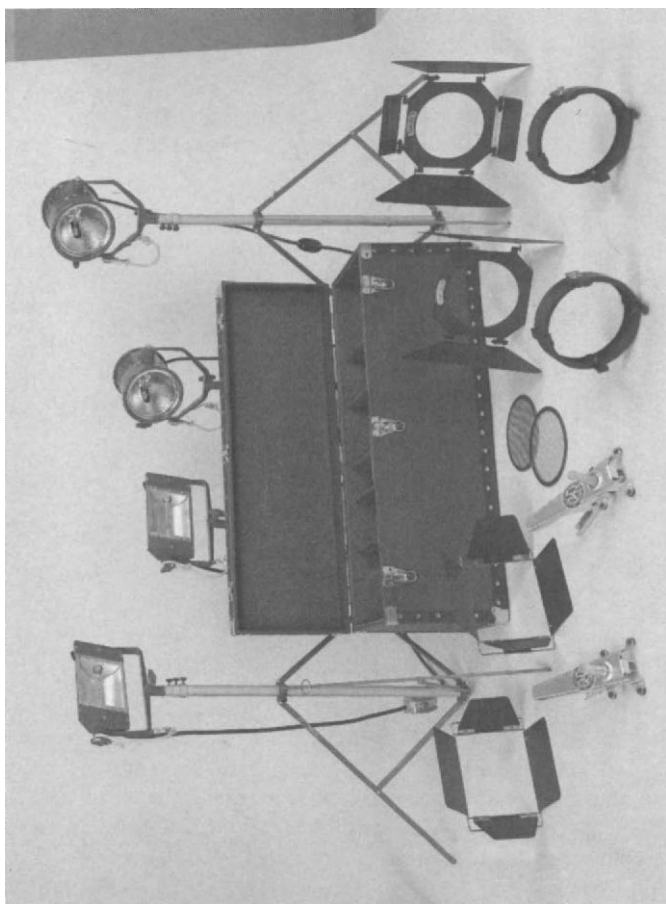


Figure L.2 Location kit. Mole quartz kit containing two teenies and two nooklites. Courtesy of the Mole Richardson Company.



Figure L.3 Lollipop (Double Matth Gag). Courtesy of Matthews Studio Equipment, Inc.

low-contrast (LC) filter A camera lens *filter* that decreases *contrast* in an image. Unlike the technique of *flashing* or the use of a *Varicon*, the LC filter affects the rendition of the light *values* as well as that of the dark values.

Lowel A manufacturer of popular lightweight lighting equipment for still and motion picture photography and video production.

low-key A type of lighting emphasizing a predominance of darkness and shadow and often high-*contrast effects*. Low-key lighting technique owes a debt to the master painters Caravaggio and Rembrandt, who developed a style that enhanced the three-dimensional quality of their subjects by using contrasting tones of *highlight* and shadow. Their subjects were often illuminated in sharp relief against dark backgrounds. This type of painting, called *biaroscuro*, utilizes directional lighting that emphasizes deep shadows and extreme contrasts; it is the antecedent to film and television low-key lighting. Detective movies, psychodramas, mysteries, and horror films customarily use low-key lighting to great effect, as does the entire genre known as *film noir* (literally, “black film”). Since the 1960s, low-key lighting techniques have crept into other genres as well, including comedies, love stories, and action films.

lumen A measure of *luminous flux*. One lumen is equal to the amount of light per second from a point source of one candlepower *intensity* emitted in a unit solid angle (i.e., an angle formed at the vertex of a cone). For example, a candle burns at about 12 lumens. A

60 *watt* frosted standard incandescent bulb is much more powerful: 855 lumens. If a uniform point source of one *candela* is at the center of a sphere of a 1 foot radius that has an opening of 1 square foot area at its surface, the quantity of light that passes through is called a lumen. The sphere has a total surface area of 12.57 square feet. Since, by definition, a lumen flows to each square foot of surface area, a uniform point of one *candela* produces 12.57 lumens.

lumen maintenance The degree to which a *lamp* maintains its original brightness over its life. As an ordinary incandescent bulb ages, it gets dimmer. Fluorescent tubes tend to dim, too. *Halogen* bulbs, conversely, have high lumen maintenance and suffer little loss in *intensity* as they age.

lumens per watt (lpw) A measure of the efficacy of a light source in terms of the light produced for the power consumed. For example, a 100 *watt lamp* producing 1,750 *lumens* gives 17.5 lumens per watt. Examples of common sources: Edison's first lamp, 1.4 lpw; *incandescent lamps*, 10–40 lpw; *fluorescent lamps*, 35–100; lpw *halogen lamps*, 20–45 lpw; mercury lamps, 50–60 lpw; *metal halide lamps*, 80–125 lpw; and *high-pressure sodium lamps*, 100–140 lpw.

lumidisc A translucent disc that inserts in front of the photocell of an *incident light meter*, used for taking specific *incident light* readings from flat surfaces.

lumigrid The perforated disc that inserts in front of the photocell of an *incident light meter* and effectively allows *reflected light* readings.

luminaire A lighting instrument, including the *lamp*, housing, *reflector*, lens, and cable.

luminaire efficiency The ratio of *lumens* emitted by a *luminaire* to those emitted by the *lamp* or lamps used.

luminance The *luminous intensity*, or brightness, that reflects from a surface measured according to candles per unit. Luminance is measured in *footlamberts*, each of which equals one *lumen* per square foot.

luminance range The series of reflected *values* in a scene from white to black, including all intermediate values, usually reflected in a comparison of percentage of light reflected from various surfaces.

luminosity See *luminous intensity*.

luminous flux The rate of flux of luminous energy emitted by a light source, measured in *lumens*.

luminous intensity The amount of light per second from a point source emitted in a unit solid angle (i.e., an angle formed at the vertex of a cone) and measured in *candelas*.

luminous object A object that glows with a photographic *luminance* value, independent of *incident light*. Television screens, fires, light bulbs, and the sky are all examples of luminous objects. Such objects usually require special *exposure* considerations in order to make a satisfactory exposure.

lumisphere A semi-spherical *translucent* white shell that affixes to the photocell of an *incident light meter*, for taking *incident light* readings of three-dimensional subjects.

lupe A small lighting instrument, housing one or more low-power *lamps*, that mounts on the camera and serves as a *fill light*. Because it moves with the camera, it can be used to light *close-ups* or *dolly shots*.

lux The international metric unit of *incident light*, equal to one *lumen* of *luminous flux* falling perpendicularly on a surface one meter square; 10.764 lux equals one *footcandle*.

M

mafer clamp An adjustable grip similar to a *C-clamp* with a 5/8" or other interchangeable pin. Its versatile rubber-tipped jaws will grip securely to cylindrical or flat surfaces, making the mafer the *gaffer's* most useful clamp. The mafer is often used to clamp the end of a *dolly track* to prevent the *dolly* from rolling off the end, can be attached to a *gobo head* to grip and support heavy frames, and can be used instead of C-clamps for hanging instruments from overhead *grids*. See figure M.1.

magenta One of the *subtractive primary* colors; a mixture of red and blue and the complement of green. Magenta subtracts the color green from *white light*; magenta *filters*, therefore, are often used to balance out the greenish cast of fluorescent lights.

magic hour Dusk (or sometimes dawn), when exterior lighting conditions are most favorable. Magic hour, which actually lasts 20 minutes or less, is the time when *contrast* is low and *bues* are most



Figure M.1 Mafer clamp. Courtesy of Matthews Studio Equipment, Inc.

saturated, often with a rose cast. Some visually stunning films such as *Days of Heaven* (Terence Malick, 1978), which won an Academy Award for cinematography, have been filmed almost entirely during magic hour.

Magic tape A *translucent* adhesive tape manufactured by 3M, Inc. Magic tape can be used to make visually seamless joins between *gels* used for filtering windows. A trade name.

main The primary distribution point of electrical power on a building.

male Prong- or tine-shaped; said of a connector that joins with a *female* connector.

mark A guide to show performers the exact positions to take, usually consisting of patches of tape on the floor out of camera view.

martini shot The last shot of a production day. Compare *Abbie Singer shot*.

masking tape A tan-colored *opaque* paper-backed adhesive tape, available in 1" and 2" widths. Although masking tape was originally designed for painters and artists for masking surfaces, it now finds many uses in lighting and other applications.

master light A popular light using the *PAR 64 1,000 watt lamp*, which can be boosted to a higher *voltage* and subsequently higher *color temperature* by means of an autotransformer. Manufactured by Leonetti Cine Rentals, Inc., Hollywood, California.

master shot The widest angle on a scene that establishes the characters in relation to their environment and to each other.

matte (1) A nonreflective, dull surface. (2) A mask used on a camera or on an optical printer to protect certain parts of the frame from *exposure*, which will later be exposed to a different scene substituting a different background.

matte box An expandable frame and bellows unit that rides on a rail or parallel rails mounted to the front of a camera. It serves as a sunshade and as a holder for *filters* and *mattes*.

Matthews Studio Equipment, Inc. A manufacturer of motion picture lighting accessories and *grip* equipment.

Matthreflector An expandable soft *reflector* material. See figure M.2 (page 100).

Matth gag A double *grip head*, used to convert a double *extension arm* to a triple extension arm.

Matthgrid A panel having a honeycomb pattern of perforations, used over the front of *softlights* to give a more directional character to



Figure M.2 Matthflector. Courtesy of Matthews Studio Equipment, Inc.

the light; a proprietary name of *Matthews Studio Equipment, Inc.* See also *eggcrate*.

Matth pole See *pogo stick*.

maxi-brute A *nine-light cluster* of 1K PARs. The maxi-brute is useful for lighting large night exteriors as well as spacious interiors such as airplane hangars, arenas, and warehouses.

Mcgrid A steel mesh panel used to collect light from a large size source and *feather* it down to a soft spot.

McMatth clamp A heavy-duty clamp, similar to a *mafer clamp*, used for fastening fixtures to an overhead *grid*. Manufactured by *Matthews Studio Equipment, Inc.*

meat ax A mounting accessory consisting of a 48" arm with a 2- 1/2" *grip head* on one end with a mounting clamp and a small handle on the other end for positioning. The long extension arm is adjustable to pivot in all directions around the clamp. The meat ax

generally mounts on the handrail of a *catwalk* and can hold a *flag* or other *gobo* to create small areas of shadow on the *set*. It comes with two clamp styles, one for the 2" x 4" handrail and the other for a *pipe clamp*. See figure M.3.

memory effect (1) A defect of nickel cadmium (*NiCad*) *batteries* that prevents them from taking a complete full charge, caused gradually when the batteries are not fully discharged and not fully charged. The result is a diminished usable life between chargings. (2) A defect of cadmium sulfide (*CdS*) photocells, used in many *reflective light meters*, that causes lag in response, leading to spurious light readings.

mercury-vapor lamp A tubular discharge-type *lamp* in which the light is produced by the radiation from mercury vapor. Used in the early days of motion pictures because its predominantly blue-green light was suitable for the red-blind orthochromatic *stock* of the day, it is now used principally for industrial lighting applications.

metal halide lamp An industrial high-*intensity* discharge-type *lamp*, in which the light is produced by the radiation from mercury, together with halides of metals such as sodium and scandium. See *HMI*.



Figure M.3 Meat ax. Courtesy of Matthews Studio Equipment, Inc.

meter-candle Another word for *lux*.

Mickey Mole A 1,000 *watt* open-faced fixture. A proprietary tradename of the *Mole Richardson Company* that has come into popular parlance. Also called simply a Mickey.

midget A 200 *watt spotlight* with a 4" *Fresnel* lens.

midgray The average of all reflecting surfaces in a given scene, calculated to measure 18 percent *reflectance* by Hunter and Driffield; analogous to *zone 5* on the *gray scale*.

mighty A 2,000 *watt* open-faced fixture. Also called a *blonde*.

mini A 200 *watt spotlight* with a 3" *Fresnel* lens.

mini-boom A miniature *boom* arm designed to support lighting fixtures, when a limited amount of extension is required. The unit is lightweight, yet provides stability through the use of counter-balance weights.

Mini Brute A type of *nine-light*, manufactured by Berkey Colortran.

mini-jib arm A portable, universal offset *jib* arm that can mount on most *dollies*. The mini-jib can rotate 360 degrees with a minimum arc diameter of 2 feet and a maximum diameter of 7-1/2 feet. A camera mounting on the end of the arm may be attached at various heights, upright or inverted, to provide a multitude of positions.

mired An acronym for "Micro Reciprocal Degrees." A unit for measuring *color temperature* computed by dividing the *Kelvin* measurement into one million. For example, 3,200 degrees *K* would equal 312 mireds, the quotient of 1,000,000/3,200. It should be noted that this system is only used for sources that can be described as having a color temperature. Since a numerical difference in Kelvin degrees for color temperatures at the lower end of the scale is far more important than the same numerical difference for temperatures at the higher part of the scale, mireds, which convey a more accurate mathematical representation of such differences at both extremes, are used to achieve *color balance* and maintain color consistency for *lamps* and *filters*. Filters that change the effective color temperature of a source by a definite amount can be characterized by a "MIREN shift value." MIREN shift values can be positive (yellowish or minus blue filters) or negative (blue or minus red/green filters). See also *Kelvin*.

Mitchell base A camera-mounting base designed for heavy motion picture cameras manufactured by the Mitchell Company.

modeling The detailed three-dimensional look of a subject achieved through the interplay of light and shadow.

modulation An expression of the difference between the lightest and darkest areas of a test pattern. Also, a continuous blending from a lighter to a darker *value*.

modulation-transfer A measure of an imaging system's ability to reproduce fine detail; it serves as a method to measure the effect of the image of light *diffusion* in a film *emulsion*.

module A flat housing designed to accept a single *PAR lamp*. Modules are often combined in rows or *clusters* of two or three lamps; modules can be bracketed together to make up two-, four-, six-, nine-, or twelve-lamp groupings. Clusters of this type are often used for outdoor applications as a substitute for *carbon arc* fixtures.

A rectangular housing fixture incorporating two or three PARs and mounted on top of a camera as an *eyelight* or fill is called an *Obie* light.

mogul A *lamp* base that is larger than standard residential size.

mole Any lighting instrument manufactured by the *Mole Richardson Company*.

MoleFAY A lighting *cluster* made up of a number of 650 *watt FAY lamps*, manufactured by the *Mole Richardson Company*. Used frequently as a *fill light* in lighting exteriors.

Moleipso A heavy-duty *ellipsoidal fixture* with a 1K or 2K *lamp*, manufactured by the *Mole Richardson Company*.

MolePAR A 1,000 *watt* parabolic aluminized *reflector lamp* manufactured by the *Mole Richardson Company*. Often used in *nine-light clusters*.

Mole Richardson Company A manufacturer of lighting instruments and accessories for motion picture and television production.

Molevator A mobile light stand that rolls on three wheels, it can be electrically extended 15 feet vertically. Manufactured by the *Mole Richardson Company*. See figure M.4 (page 104).

motivated lighting Lighting designed to appear to come from logical sources, as from windows, candles, *practicals*, or streetlamps. Also called motivation lighting.

motivation See *motivated lighting*.

MR-16 A *tungsten-halogen* projector *lamp* incorporating a small self-contained *reflector*. Used in conjunction with a *dimmer*, the MR-16



Figure M.4 Molevator. Courtesy of the Mole Richardson Company.

serves as the smallest available lighting unit. These tiny lamps are useful in tight areas where even an *inkie* would be too big.

Mueller clips See *alligator clips*.

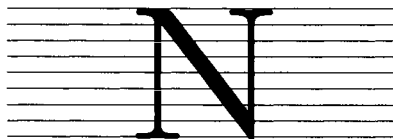
multicamera production A method of television production that utilizes several cameras. Since editing is done primarily in real time via a switcher, *set* lighting must be general enough to be acceptable from several camera angles simultaneously. Used for talk shows, game shows, and other “live” programming.

multilight, multiple light Any single lighting fixture using a number of *lamps* either with separate *reflectors* and lenses for each lamp or

a single reflector for all. In most units, the individual *globes* can be turned on or off. Used primarily as a *fill light*.

Musco lights A powerful lighting bank consisting of several 6K HMIs mounted permanently on a crane truck. The truck comes with a self-contained 1,000 *amp generator*. A handheld remote control device can aim each instrument independently from distances up to 1,000 feet away. The *boom* allows lighting elevations up to 100 feet. The Musco light bank can throw a workable *illumination* up to a half mile and is excellent for illuminating broad areas and simulating moonlight *effects*.

muslin A coarsely woven cotton fabric used as a reflective material for *bounce lighting*.



nanometer A metric measurement of wavelength, equal to one billionth of a meter. Visible light waves are measured in nanometers; the *visible spectrum* is comprised of electromagnetic radiation in wavelengths ranging from 400 (violet) to 700 (red) nanometers.

narrow spot (NSP) A *PAR lamp* with a clear, lightly textured lens. The narrow spot has tremendous *punch* and can throw an intense beam that reaches distant and otherwise unreachable areas.

natural lighting (1) Ambient lighting that emanates from sources other than lighting instruments, such as *daylight*, candlelight, or sometimes *practical lamps*. (2) The philosophy that the filmmaker lights shots with as little manipulation as possible, to emulate the available light as closely as possible, in an effort to create a more convincing sense of verisimilitude. Natural lighting became popular in the 1960s and 1970s as faster film *emulsions* and lenses became more common and as a reaction to the slick *studio* lighting prevalent in Hollywood films up to that time.

net A *C-stand*-mounted *gobo* that cuts light *intensity* of a source without greatly diffusing it, usually made of black porous cloth. A net is made of cloth-mesh material stretched on a frame and mounted on a C-stand. A cloth net may be used close to a *Fresnel* instrument when it is used in the “full flood” position but should not be placed too close when the lamp is spotted down, as the heat will damage it. A net should never be placed close to an open-faced fixture.

A hexagonal weave (looking like a honeycomb pattern) net fabric is preferred for professional lighting because, unlike the traditional screendoor-type weave, it breaks up light most evenly. Of course, the more threads (and fewer openings) in a weave, the less light will pass through it.

Black nets tend to cut light intensity with a minimum *diffusion* effect, where *lavender* nets add diffusion; white nets will soften the light considerably. Nets come in several “strengths,” depending

upon how many layers of weave are used. A net with a single layer, color-coded green, cuts about 30 percent of the passing light while a double, coded red, cuts transmitted light by 50 percent. A single lavender cuts light by 15 percent. A *silk* is a white fine-weave net used primarily for adding diffusion; the amount of light it passes depends on the proximity of the silk to the light source. When sandwiching two or more nets, a moiré pattern (a wavelike “plaid” effect) can be eliminated by rotating one of the nets in relation to the other. Compare *scrim*. See figure N.1.

neutral density (ND) filter A *filter* that cuts *transmission* of light without otherwise affecting its *color temperature* or quality. Calibrated in one-third *stops*; an ND .3 cuts light one stop. NDs are useful when shooting a *fast* film outdoors under bright sunlight. ND filters are often combined with other filters in the same *gel* or glass; ND and #85 are often combined as an 85N6 filter.

NiCad A nickel-cadmium cell or *battery*, the most commonly used direct power source unit used in film and video production. NiCads retain an electrical charge much longer than other types of batteries, and their output strength remains constant until they wear down. NiCads are subject to *memory effect*, which will diminish a battery's ability to take a full charge if it is repeatedly only partially recharged. NiCads should never be stored in a discharged state. They tend to lose power when they become too cold.

night-for-night Shooting exterior night scenes during actual nighttime hours, as opposed to *day-for-night* or dusk-for-night.

nine-light A *cluster* fixture comprised of nine *PAR lamps*, used often for lighting exteriors. The nine-light makes a very effective fill when shooting in brilliant sunlight. See figure N.2 (page 108).

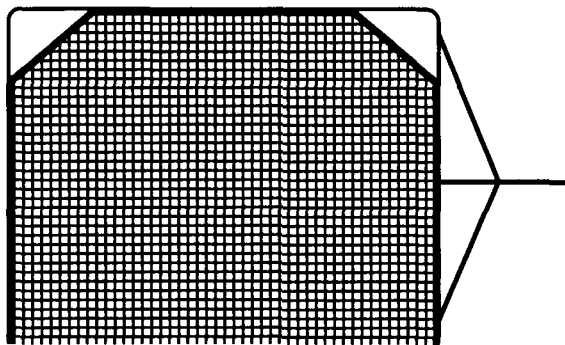


Figure N.1 A net. The feathered edge is for smooth blends between light and dark areas.



Figure N.2 Nine-light. Courtesy of the Mole Richardson Company.

noise The video equivalent of *grain* in an image, also known as snow. Noise may be caused by boosting *gain* in low light situations, excessive duplicating, or outside interference.

nook A compact, nonfocussable 1K *broad* manufactured by the *Mole Richardson Company*. Nooks are often used on *location* shoots and are so called because they can be placed unobtrusively in tight corners and cubbyholes.

NTSC National Television Systems Committee. An eponymous term that has come to designate the current technical video and broadcast television format used in North America and Japan. The NTSC standard features a video image composed of 525 scanning lines, a frame rate of 30 frames per second, and a screen *aspect ratio* of 4:3.

number one wood clamp A household *clothespin*. Also called *C-47*.



Obie An *eyelight* mounted over the lens of a camera. The light takes its name from the actress Merle Oberon, whose facial bone structure photographed optimally under such a fixture. See figure O.1.

offset arm A light stand accessory consisting of a mounting receptacle and a horizontal extension bar with two 5/8" mounting pins. Used to bring a fixture closer to a subject than the stand will normally allow or to suspend a *lamp* over a wall or other obstruction. The offset arm allows the lamp to point straight down at a subject. See figure O.2.

ohm A measure of electrical *resistance*.

Omni light A lightweight, compact open-faced fixture manufactured by *Lovel* Lighting, Inc. Lowel supplies a wide array of accessories for the Omni, which may be used as a self-contained umbrella bounce unit. The Omni is often used as a *battery*-powered hand-held unit known as a *sun gun*. See figure O.3 (page 112).

opal diffusion A popular translucent polyester sheeting used to soften light.

opal frost A light polyester sheet *diffusion* used to slightly soften light.

opaque Said of any object or material that does not transmit light in any degree.

open-faced light A lighting fixture that does not have a lens.

overall gamma In film printing, the combination of all *gammas* of the individual components, such as original negative and print *stock*, in an imaging system. The overall gamma determines the ultimate *contrast* in the final print.

overall luminance range The ratio of the highest significant *luminance* to the lowest. The overall luminance ratio of most scenes generally extends to 500:1 or greater.



Figure O.1 Obie. Courtesy of the Mole Richardson Company.



Figure O.2 Offset arm (junior). Courtesy of Matthews Studio Equipment, Inc.

overall useful range The practical *latitude* of a film, expressed in the *characteristic curve* as the combination of the straight line, the *toe*, and the *shoulder* as plotted on the $\log E$ axis. The longer the straight line portion and overall useful range, the larger the *gray scale* sensitivity, resulting in lower *contrast* and greater image fidelity.

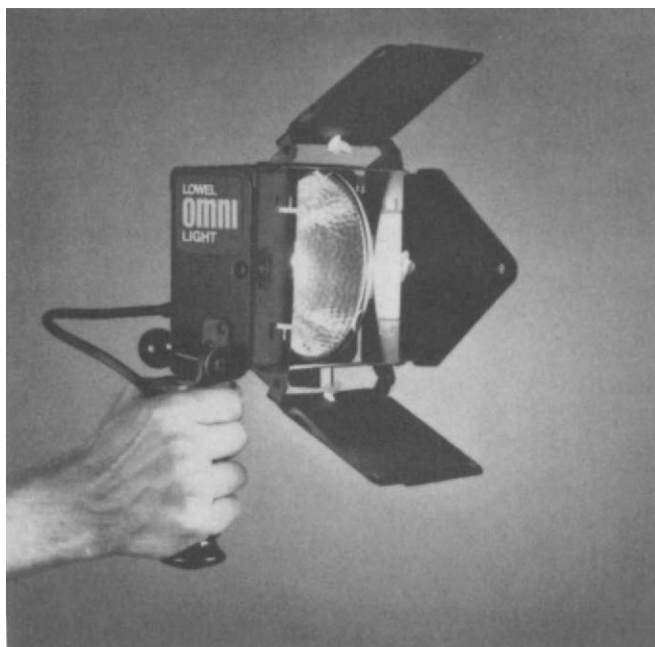


Figure O.3 Omni light. Courtesy of Lowel Lighting, Inc.

overexposure An *exposure* made at too wide an *aperture*, resulting in placing most of a subject's *luminance range* too high on the *characteristic curve*. The resulting image will exhibit light gray *values* crushed to white, and dark and black tones rendered as light gray; and the image will appear generally washed out. Overexposure in an image is sometimes desirable to attain a certain effect. In the film *Close Encounters of the Third Kind* (Steven Spielberg, 1978), for example, overexposure is used intentionally to capture the intense light on the awestruck faces of scientists watching a spacecraft descend into their compound.

overhead A large *silk* in one of two sizes, 12' x 12' ("twelve-by") or 20' x 20' ("twenty-by"). The silk is used to soften the effects of direct sunlight. A twelve-by requires two *high-riser stands* to support it and a twenty-by usually needs four stands. A very large (measuring 12' square up to 20' square) frame that supports a stretched *net*, silk, or *solid* (a large *flag*). It is used to filter or block light from a two- or three-shot and also to shade any large *prop* such as an automobile. The overhead is supported by two or four heavy roller

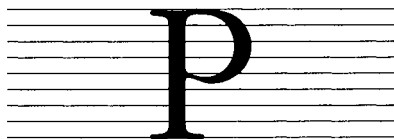
stands with oversized *gobo heads*. *Overhead stands*, used to hold anything that has to go higher than a *C-stand* can extend, are often called "*high-rollers*." Wind can play havoc with a large overhead; hence, they are often secured to the ground with ropes.

overhead stand A heavyweight rolling stand used for securing *overheads*. There are several sizes of overhead stands, popularly called *high-rollers*, ranging from junior to high to "high high." Overhead stands are wide-based units designed for added stability. The legs slide up and down the center shaft to work in a tighter environment. Overhead stands are used primarily in exterior *locations* where a heavy stand is necessary. The high roller accommodates a large 4-1/2" *grip head*; most of the newer high roller grip heads have a receptacle on the backside that will receive a 1-1/8" pin. See figure O.4 (page 114).

overlighting A tendency to use too much *illumination* or too many sources when lighting a scene. Overlighting compromises the inherent mood of a scene in an actual *location* and creates a stagey and highly artificial effect on a *sound stage* as well.



Figure O.4 Overhead stands. Courtesy of Matthews Studio Equipment, Inc.



paddle A lever used to adjust the relative position of the *lamp* inside an enclosed or open-faced *spotlight*, for various *flood* or *spot effects*.

paddle plug A type of flat electrical plug used in older theaters. Also called a half-stage plug.

pancake A thin, flat wooden block, having one eighth the depth—but the full length and height—of a standard *apple box*. The pancake is used for slightly elevating stands or other objects.

pantograph An extendable “lazy-tong” or double-scissor type overhead *luminaires* support, used predominantly in television *studios*. A set of counterbalance strip springs is pulled down and clipped to crossbars, according to the weight of the fixture being supported. The pantograph is easily raised and lowered from the floor by means of a pole.

paper amps An *amperage* rating given in rounded figures higher than the actual amperage.

paper tape A cellulose-based adhesive tape available in 1”- and 2”-width rolls, similar in appearance to *masking tape*. Although it is available in white and certain other colors, most *grips* prefer black-based tape because of its nonreflective *matte* surfaces, which make it virtually invisible to film and video cameras. Paper tape is recommended for use on painted or other surfaces that might peel with the more tenacious *gaffer tape*.

PAR A *sealed-beam* parabolic aluminized *reflector lamp*, similar in design to an automobile headlight. PARs are available in a wide variety of sizes and beam spreads. Because the PAR utilizes a long *filament* inside the reflector, it casts an oval rather than circular beam. Thus, the beams of several lamps can be aimed to “fit” tightly together.

The PAR is especially important because of the punching efficiency of its beam. A narrow spot 1K PAR throws a beam com-

parable in center *intensity* (but not in width) to the beam of a 10K *Fresnel*. Because the intensity of a PAR lamp's *illumination* translates to a good deal of focused heat, a PAR will quickly burn through *gels*, melt *beadboard*, and ignite *foamcore*. Special PAR lamps (called *PAR-FAY* lights) are available with *dichroic filters* to make them usable as *daylight*-balanced sources.

PARs are mounted in three basic configurations. Single lamps for film production may come in a solid rotary housing that has brackets for *barndoors* and *scrims* or may be mounted in a flimsy sheet metal cylinder known as a PAR can (used mostly in overhead stage and concert lighting). A third PAR mounting design is the module, which can be used singly or as part of a *PAR cluster*, as in a *nine-light*. See figure P.1.

parallels Temporary *scaffolding* used as platforms for camera or heavy lighting equipment. Parallels come in standard 6' x 6' sections with leveling legs and wheels. When safely tied off at every other tier to a building or other stable support, they may be stacked up to three high (with second- and third-level wheels removed). When stacking two or three, parallels should be grouped for stability. Parallels used close to a building should be braced with special spacer pipe that makes contact with the wall; larger sections require the use of outriggers. The top story of the scaffolding should be fitted with hand railings for safety. See figure P.2 (page 118).

PAR-FAY A *sealed-beam* parabolic aluminized *reflector lamp* incorporating a special *dichroic filter*. The PAR-FAY has a *color temperature* that closely approximates *photographic daylight* and is frequently used in two-, four-, six-, nine-, and twelve-light *clusters* for outdoor fill *illumination*.

PAR 64 A 1,000 *watt sealed-beam* parabolic aluminized *reflector lamp*. Measuring 8" across, the PAR 64 incorporates a highly efficient parabolic reflector that is capable of projecting a beam with very little spread. A wide array of detachable lenses are available, from the completely clear, very narrow spot (VNSP) lens to the wide beam PAR.

PAR 36 A 650 *watt PAR lamp*.

partial lighting A *low-key* high-contrast lighting technique typical of *film noir* pictures of the 1940s and 1950s. Partial lighting emphasizes the eyes of a subject by shadowing much of the body and background as a way of creating a sense of menace and mystery.

pattern A thin metal *cookie* that can be placed in a slide and used to project onto a *backdrop* a specially designed pattern of light, such



Figure P.1 PAR. Courtesy of the Mole Richardson Company.



Figure P.2 Parallels. Courtesy of Matthews Studio Equipment, Inc.

as foliage or window frames. Patterns are often used in *ellipsoidal fixtures*.

peanut A small bare-bulb 250 or 500 *watt tungsten-halogen lamp*, often placed in or behind a *practical* to augment its light. The light emitted by the peanut should appear to be emanating from the practical itself. The simplest way to hide a peanut is inside the shade behind the actual practical lamp, wrapping the wiring of the peanut around the cord of the existing fixture. The peanut bulb must not touch anything surrounding the fixture; it should also have sufficient ventilation.

pedestal (1) The portion of a video signal where black registers, generally measuring 7.5 IRE on the *waveform monitor*. The *black level*, or *black gamma*, is controlled by adjusting the pedestal or black level. Raising the pedestal, by increasing the IRE of the black level, effectively reduces *contrast* in an image at the expense of losing true black; it is analogous to *flashing* in film. Although pedestal adjustments are most commonly done in postproduction, high-end

video cameras also allow for the pedestal/black value gamma to be adjusted electronically. (2) A heavy wheeled camera support, for use with television cameras in a *studio*.

Pepper A small *Fresnel* fixture in one of several sizes accommodating a 100, 200, 420, 650, or 1,000 *watt tungsten-halogen lamp*. Manufactured by LTM Corporation.

perms Permanently installed *catwalks*, with 1-1/8" *receiver* sockets at intervals to accommodate *bazookas* and large instrument *spuds*.

phosphors A coating on the inside of CRTs and *fluorescent lamps* that glows with radiant visible light when stimulated by another form of electromagnetic radiation, such as *UVs*.

photoconductive light meter A *light meter* design that uses a light-sensitive cell made of cadmium sulfide (CdS). Unlike the selenium cell, which produces a minute *voltage* when struck by light, the *CdS cell* acts as a semiconductor that varies its electrical *resistance* according to the amount of light that strikes it. A *battery* provides the *current* and the CdS regulates the amount of that current by its variable resistance; the changes in current are then displayed by the microammeter as a light reading.

The advantage of the CdS cell is its high sensitivity, about ten times that of an equivalent selenium meter. This makes the CdS cell well-suited for very low light situations and meters with limited *acceptance angles*. For this reason, CdS cells are used almost exclusively in *reflected light meters*, especially *spot meters* and in through-the-lens metering systems.

Light meters of this type are very versatile; they are often sensitive enough to give readings in moonlight. There are, however, definite disadvantages. For one, they use batteries and, like so many battery-powered instruments, frequently need recalibration due to voltage inconsistencies when batteries inevitably run down. Batteries and the voltage-regulating circuits that often accompany them add extra weight and bulk to the meter as well. The CdS cell also suffers from sensitivity lag, a problem similar to light lag exhibited by certain video pickup tubes in low light situations. In dim light, the meter does not respond very quickly to small changes in *illumination*.

photoflood An *incandescent lamp* similar to (but more powerful than) a standard household *tungsten* bulb, used primarily by still photographers for *studio* lighting. The photoflood generally burns at a *color temperature* of 3,400 degrees *K* and is designated as "tungsten A." Photofloods are rarely used in motion picture and television production nowadays because they share the same disadvantages as standard house lamps: they suffer from a steady

drop in color temperature output over the life of the lamp due to *boil-off*, and they are generally manufactured in relatively low wattages, limiting the effective *illumination* of the light.

photographic daylight A combination of midday sunlight plus skylight, used as a *color temperature* standard for *daylight*-balanced film. Photographic daylight is supposed to approximate the *Kelvin* of outdoor sunny daylight at approximately noon in the Northern Hemisphere; 5500 or 5600 degrees Kelvin.

photometry The science of light measurement. The standard unit for light measurement was originally based on the visible radiation of a single candle, called the *standard candle*. The old standard candle has been superseded by the *candela*, defined as 1/60th of the *luminous intensity* of a *black body* at the temperature of melting platinum.

It is important to distinguish between and among terms that refer to (1) the light source itself, (2) the amount of light falling on a given surface, and (3) the brightness of the light reflected from the illuminated surface. The radiation that emits from a light source is called luminous intensity and is rated in candela, or candlepower. The sum total of light falling on a subject is known as *incident light*. Subjects that are illuminated reflect back some of the light incident to them; this is known as *reflected light*.

Luminous intensity and *illumination* are terms that refer to systems for measuring incident light, while reflected light is measured in terms of *luminance*. "Brightness" is a general term often used interchangeably with illumination and luminance. In the U.S., luminous intensity is most commonly measured in *footcandles*. The footcandle is the amount of incident light measured at a point one foot from a standard candle. The *lux* is the international metric counterpart to the footcandle. One footcandle equals 10.76 lux. See figure P.3.

photomultiplier A *filter* slide or screen that mounts over the light-sensitive cell of an *incident light meter* in order to convert it to a *reflected light meter*. The photomultiplier may utilize perforated *baffles* or a honeycomb glass pattern in its design.

photosphere See *lumisphere*.

photovoltaic meter A *light meter* that uses a light-sensitive cell consisting of selenium bonded to a metal base plate and covered with a thin film of gold or platinum. As light falls on the cell, *current* is generated and measured by a microammeter, which measures minute amounts of *voltage*. As a greater amount of light falls on the cell, more current is generated and a higher reading is displayed on the meter, and vice versa. Meters of this type are simple in con-

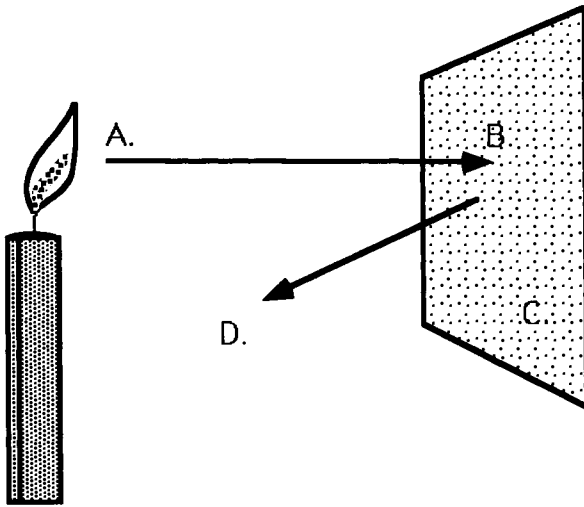


Figure P.3 Photometric terms. Luminous intensity (A), measured in candela, is the amount of light emitting from a source. The sum total of all light falling on a subject is called incident light (B). In the U.S. the measure of incident light is the footcandle (everyone else uses the meter-candle, or lux). The amount of illumination striking an area one foot square at one foot's distance equals one lumen (C). Light emanating from a reflective surface is known as luminance or reflected light (D), which is measured in footlamberts.

struction and require very little maintenance. The cells have a spectral sensitivity similar to film *emulsions* so no special color compensation is necessary.

The one drawback to the selenium photovoltaic meter is its relatively poor sensitivity to low light levels. Nevertheless, the rugged selenium meter design is well suited for incident-type meters used in the motion picture industry. If there is not enough light to move the needle on the light meter, there usually isn't enough light to shoot film. However, for situations involving *high-speed film* and low-light levels, and for reflected, spot, and through-the-lens applications, a photoconductive meter design is often used.

pickup tube A light-sensitive vacuum tube device that uses an electron gun to form the image in a traditional video camera. In modern video cameras, pickup tubes have been largely superseded by *charge-coupled devices*.

pigeon A plate with a number of screw holes around its perimeter and bearing a 5/8" pin or a *junior* receptacle, used to affix instruments

to walls, floors, ceilings, and other flat surfaces. See also *baby plate*.

pin plug A simple electrical connector consisting of a copper cylinder split down the middle. Pin plugs are frequently used to join the head *cables* of large *tungsten-halogen* fixtures. The construction of pin plugs make them subject to breakdown; hence, they need maintenance to ensure a solid connection. A loose connection can be fixed by gently prying apart the two halves of the *male* connector and rejoining the connection.

pipe clamps A specialized theatrical clamp that can mount directly to a pipe or *grid*. Primarily used in *studio* situations, the pipe clamp can be used to free up light stands. *Junior* pipe clamps end in a 1-1/8" receiver, whereas *baby* pipe clamps end in 5/8" pin.

pitting The formation of tiny holes on the surface of a *lamp* base or socket; a type of corrosion.

plane lighting A method of visualizing and lighting a subject or scene as a series of planes. Planes are lit to different levels of brightness, often with the largest or closest objects darkest.

plano-convex lens A simple fixture lens that has one flat surface and one spherical surface. Because of its great mass, it is quite heavy and does not dissipate heat. This lens is most often found in the *ellipsoidal fixture*.

plate A background for any kind of *process shot*.

platypus See *quacker*.

pogo stick A long telescoping aluminum pole loaded with a strong spring to keep the pole at its maximum possible extension, used to support lightweight lighting and *grip* equipment. The pole has a nonmarring rubber tip at either end to grip walls without slipping, and it can be used vertically or horizontally. A cam action lock exerts pressure to securely wedge the suction cup affixed ends into place. The pogo stick, also known as a *polecat* or a *Matth pole*, is used on *location* to form a makeshift *grid* on which lightweight fixtures can be mounted. It should be noted that the tube walls of the pogo stick are structurally thin and can only support lightweight lighting equipment hung with *mafer clamps* or other light action devices.

polarity In *direct current*, the direction in which the current flows, defined as positive or negative.

polarizer A *filter* that saturates colors and reduces or eliminates glare and *reflections* from glossy surfaces such as glass and water, to

increase color *saturation* and also to darken the sky in landscape photography. Light, which normally vibrates in all directions at right angles to the direction of its propagation, is polarized when it reflects from a glassy surface. The polarizing filter acts like a grille, blocking all but light vibrating in a single plane.

Polaroid camera A camera using instant sixty-second Polaroid film; used frequently to record scenes for continuity.

polecat See *pogo stick*.

pool A circular area of cast light from a source, as thrown on a floor, wall, or subject.

pop-up casting A *junior* receiver with a built-in retractable *baby* pin, for mounting both types of fixtures.

porcelain A heavy-duty *extension* that ends in a single- or double-pocket *stage plug* socket. The porcelain, so named because of its heavy porcelain housing, is generally rated at 60 or 100 *amps*.

post-fogging See *flashing*.

poultry bracket A reinforced T-shaped bracket with both a 5/8" pin and a 1-1/8" receiver that allows lighting fixtures to be strapped with tie-down straps to a tree, lightpost, or telephone pole.

power In electricity, work done or energy transferred per unit of time.

practical Any *prop* on a *set* that functions normally, for example, a desk lamp that serves as a light source within a scene. In evening scenes, practical *lamps* become the natural point of *motivation*. The available *illumination* of any practicals can be increased by replacing standard *incandescent lamps* with high-output *photo-floods*, thus raising the *color temperature* and the *luminous intensity* of the fixtures. The light from such a motivated source does not provide enough illumination in itself to act as a *key light* but can fill areas in a background and boost overall *base light*.

prep, to (verb) To get ready for a job. Prepping may entail checking out equipment to insure that all items are in good working order before taking them out in the field and using them.

prefocus base A *lamp* base that fits only one way into a socket so the *filament* is in correct relationship to the *reflector* and lens.

pre-lighting See *pre-rigging*.

pre-rigging The practice of setting lights before the shooting day, before the rest of the crew arrives. To do a pre-rig, it is necessary to determine the *amperage* of *circuits* and note how they are distributed through the building one will be using. One should lay

and tape down enough *ac cable* to power all lights needed to illuminate the *sets*.

It is often wise to mount the instruments above the set with as few floor stands as possible. Light stands clutter the set, intrude on the *action*, and invite accidents. Often, lightweight instruments can be clamped to rafters, moldings, or doors and doorway lintels. In rooms with drop ceilings, it is possible to use special *scissor clamps* to hang light fixtures from the T-bar drop ceiling frame. Since many actual *locations* do not offer overhead mounting possibilities, however, it is usually necessary to rig some kind of overhead *grid*.

prime fixture An open-faced fixture that has a round housing, no base, and fluting or perforations at the top to vent heat. Much of the intense heat generated is dissipated at the open face of the instrument. Some have an on/off switch on the housing; most have an in-line switch on an *ac cable* connecting directly to the housing. A focusing control at the back of the fixture controls the degree of *flood* or *spot*. In this case, the light source is moved in relation to the *reflector*, which remains stationary.

prime lens A fixed *focal length* lens. Such lenses are generally sharper and faster than zoom or *variable focal-length lenses*.

printer points A range of *exposure* increases used by a film laboratory timer for altering the amount of light when printing from negative (or camera original) to positive. Originally, printer points were calculated in logarithmic scales of $.05 \log E$ but are now more commonly figured in a scale of $.25 \log E$.

printing contrast The acceptable level for negative or positive film that is to be printed, ideally when the negative *gamma* measures from .6-.7. Such *stocks* are low in *contrast* because their *density* increments are less than their plotted *values*.

prism A transparent solid piece of glass or plastic, often having a triangular base, used for dispersing light into a spectrum or for reflecting beams of light.

process shot A shot that is composited from two or more other shots. Automobile interiors are often shot as process shots, in a *studio* with a rear or front projection of the moving scenery.

production designer See *art director*.

projection contrast An acceptable level of *contrast* for projection films and prints with *gammas* between 1.6 to 1.8. *Reversal* films such as Kodak's Kodachrome are projection contrast *stocks*.

Pro-light A multipurpose compact open-faced fixture with a *lamp* of 250 *watts* or less, manufactured by *Lowel* Lighting, Inc. A wide array of accessories is available for the Pro-light. See figure P.4.



Figure P.4 Pro-light. Courtesy of Lowel Lighting, Inc.

prop Short for property. Any movable object used as part of a scene, such as a chair or a vase.

pulling aperture Adjustment of the *aperture* ring by the camera assistant while filming. Similar in practice to *pulling focus*, but a much more exacting process.

pulling film Underdevelopment of a film *emulsion* in order to make the emulsion effectively slower. Pulling is usually done by a lab when film has been overexposed by mistake.

pulling focus Adjustment of the *focus* ring by the camera assistant while filming.

punch The degree of relative beam *intensity* of a light. *PAR lamps* in particular are noted for their "punch."

Purkinje effect The phenomenon that makes moonlight appear blue to the eye, despite the fact that moonlight is the same *color temperature* as sunlight. This subjective effect occurs due to the reflex adaptation of the eye to dim light, in which there is an increase in

the number of functioning blue-green sensitive rods and a decrease in the number of functioning red-orange sensitive cones.

pushing film See *forced processing*.

putty knife A painter's putty knife that has a 5/8" pin affixed to its handle. The knife allows a light mounting to be wedged into the slot of a door frame or window sill.

pyrotechnics Any kind of fireworks or explosives used for special effects in a production.

Q

quacker A vise grip bearing 5/8" mounting pins and a 5" x 6" metal plate welded to each jaw. The quacker is designed to grip large, relatively fragile flat sheet material such as *beadboard* and *foam-core* without breaking or mangling it. See figure Q-1.

quad-light A lighting unit with four 500 *watt* floodlights. See figure Q.2 (page 128).

quadrant A mounting accessory consisting of a pivoting *baby* pin attached to a 5/8" *receiver* that affixes to a standard baby stand and allows tilts up to 45 degrees from the normal vertical axis.

quartz lights A nickname for *tungsten-halogen lamps*, from the pressure- and heat-resistant quartz glass used for the *envelopes* in such lamps. The term quartz may also refer to the standard color temperature of *tungsten*, 3,200 *K*.

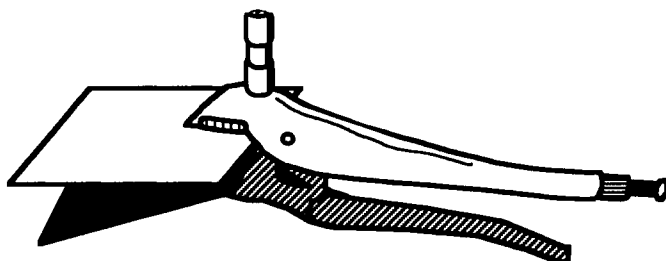
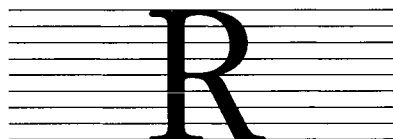


Figure Q.1 Quacker



Figure Q.2 Quad-light. Courtesy of the Mole Richardson Company.



radiating source Any light source that emits light in all directions, such as a flame, *filament*, or *arc*. The largest radiating light source is the sun.

rag Any fabric that must be stretched on a frame for use as a *net* or *silk*.

raster The illuminated video signal comprised of scan lines on the face of a cathode ray tube; the raster does not include any picture information.

raw stock Motion picture film that has not yet been exposed.

receiver A socket for a 5/8" or 1-1/8" pin or *spud*.

reciprocity The law of physics that explains the interdependent relationship between light *intensity* (*f-stop*) and time (*shutter speed*) and its effect on photographic *exposure*. Reciprocity is often expressed as an equation: $\text{EXPOSURE} = \text{INTENSITY} \times \text{TIME}$. If either the intensity of light or its period of duration are halved, the other variable must be doubled in order to arrive at the same exposure. Therefore, 1/60 sec at f-8 produces the same exposure as 1/125 sec at f-5.6. This law of reciprocity is constant for all but very long (over 1 second) or very short (under 1/1000 second) exposure times.

Filmmakers generally have fewer options than photographers in terms of reciprocity, because they must shoot at a constant frame rate (24 or 30 frames per second) for normal synchronous sound filming. This translates to a fixed shutter speed of anywhere from 1/48 to 1/64 second. For this reason, lighting for motion pictures is generally more complex than lighting for still photography.

rectifier A device used to convert *ac* to *dc*, as in powering *carbon arc lamps*.

redhead An open-faced 1,000 *watt* fixture; also known as a *mickey*.

reference black A black object placed in a video scene or into low *contrast*, light-toned film images in order to keep them from being artificially darkened during postproduction.

reference white A white object placed into a video scene or dark-toned low-*contrast* film images transferred to video. Inclusion of a reference white tone ensures that the light *values* are not mistaken for white and boosted electronically, which would result in washed-out images.

reflectance or reflection factor The amount of diffuse bounce light that emanates from reflecting surfaces, expressed as a percentage of the *incident light* striking it. The reflectance of a white card is about 90 percent, whereas a medium gray card reflects about 18 percent. Black velvet reflects about 3 percent of all light striking it.

reflected light Light reflected from a surface, after losses due to absorption and scattering. Exposed film images are the result of the reflected light of photographed subjects. The amount of measurable reflected light, measured in *footlamberts*, depends on four factors: (1) the *incident light*; (2) the *value* of the surface, whether light or dark (*reflectance*); (3) the texture of the surface, whether *matte* or shiny; and (4) the angle from which the measurement is taken, especially when measuring *specular* surfaces.

reflected light meter An *exposure* meter that measures light reflecting from a subject, as opposed to light that falls on the subject. Camera through-the-lens and auto-*iris* metering designs use the reflected light meter system. Reflected light meters are designed with a light-sensitive cell located behind some sort of shield to control the light *acceptance angle*. This shield may be a perforated grid, a simple narrow tube, or a lenticular magnifier. The idea is to produce a meter that is more or less directional so that it can be pointed toward a given object and not read light from all directions at once.

The reflected meter, which reads the brightness of the light reflected by objects in the scene, is calibrated for 18 percent *reflectance* (medium gray). The *cinematographer* must decide whether the subject is to be reproduced as medium gray. For instance, a light-colored face reflects about 36 percent light, while a darker face may have less than 18 percent reflectance. The meter, however, “sees” each as having 18 percent reflectance and will not give ideal readings, underexposing light fleshtones and overexposing the darker complexions. The way to avoid guesswork is to use an 18 percent reflectance *gray card* and measure light reflecting off of it instead of the subject (see below).

There are several ways to use a reflected meter: (1) integrated

readings of a complete scene; (2) measuring specific tonal areas; and (3) reading an 18 percent reflective gray card. An integrated reading of a scene as a whole is the most common method of using the reflected light meter, particularly among amateurs. This is also the least accurate method. Depending on how the meter is aimed at the scene, it may take in too much bright sky or dark earth and thus give false readings. Measuring single-tone areas of the scene will lead to more accurate exposure control. Reflected light readings of the darkest and lightest areas are taken, and an exposure value will be chosen from these two extremes. Such an exposure should, as closely as possible, capture the entire tonal range.

A third technique is to use the reflected light meter to read a subject of known and constant reflectance, usually a gray card. The gray card is specially designed to reflect 18 percent of the light striking it, which is an average of the brightest, the darkest, and all the intermediate tones of any given scene. These medium-gray cards correspond to the calibration of incident meters, enabling the reflected meter to give the same reading (when used properly) as an incident meter. The card should be angled halfway between the light source and the camera for the most accurate reading.

reflection The return of light or heat after it strikes a surface.

reflective meter See *reflected light meter*.

reflector A component of the optical systems in most lighting instruments that gathers, focuses, and reflects forward the rays emanating from the rear of a *lamp*. Reflectors vary widely in shape, configuration, and composition, depending on the fixture. *Fresnel* fixtures generally incorporate a spherical mirror-surface reflector, whereas *Lekos* use a similar surface ellipsoidal reflector for focusing light into a hard coherent beam. *PAR* lamps include a parabolic reflector as part of the basic lighting unit. Diffused light fixtures such as *scoops* or *softlights* may use a large bowl- or basin-shaped reflector.

reflector board A large rigid panel that pivots on a yoke mounted on a heavy stand. The reflector board has two metallic sides, one "hard" and one "soft." The hard side is a smooth reflective surface, which reflects a highly *specular* light. The soft (or "lead" as it is sometimes called) side bears a gridwork of delicate foil leafing, which breaks up the light to provide a softer light. These silvered surfaces are used to bounce the sun's rays into shaded areas to reduce the *contrast* between sunlight and shadow. Reflector boards are usually surfaced with silver-colored foil, but other colors are also available. A gold surface reflects an amber light and can imitate sunset or sunrise *effects*. Gold reflectors give a pleasing

warmth to fleshtones and particularly enhance the appearance of dark-complected actors. They also impart a lush, saturated look to plants and foliage in general. Blue- or cool-surfaced reflectors are sometimes used to boost the *color temperature* of a reflected *tungsten lamp* or the setting sun to 5,500 degrees *K*.

A reflector board must be positioned properly in relation to the sun to catch its rays. The easiest way to aim the reflector is to (1) point the reflector at the sun, (2) tilt the reflector down until the reflected beam can be seen on the ground, (3) swivel the board until the beam is just under the subject, and (4) tilt the board up until the reflected beam illuminates the subject. See figure R.1.

rehearsal A practice run of a scene or sequence of scenes, in preparation for an actual filmed performance.

release print A film print with finished sound track struck from an interpositive (or master positive) or from a color reversal intermediate directly from an original negative. Release prints are usually made in large numbers for simultaneous commercial release in several theaters, after a sample print made from the same negative is approved.

Rembrandt cheek patch A triangular patch of light that falls on the shadow side of a subject's face when the *key light* shines at about a 45 degree angle; a traditional starting point when setting key light position.

Rembrandt lighting A type of lighting that emphasizes a strong modeling of light and shadow on a subject's face, reminiscent of certain Rembrandt paintings. Rembrandt lighting generally utilizes a high three-quarter *key light* placed at a 45 degree angle to create the familiar cheek patch on the shadow side of the face, in addition to the usual *fill light* and *backlight*.

resistance The phenomenon that works against the flow of electricity in a *circuit*, analogous to friction in mechanics. Resistance, which is measured in *ohms*, can result in heat buildup and *voltage* drop. Some *dimmers* rely upon resistance to lower the *intensity* of lights.

reversal film A type of film that produces a camera original positive image, without the need for printing. Reversal was widely used for news filming before improved portable video equipment made it obsolete. Reversal film is still widely used by still photographers for transparencies or slides. Reversal film is a projection contrast medium and thus produces prints that are high in *contrast*.

REV globe A type of *incandescent lamp*.

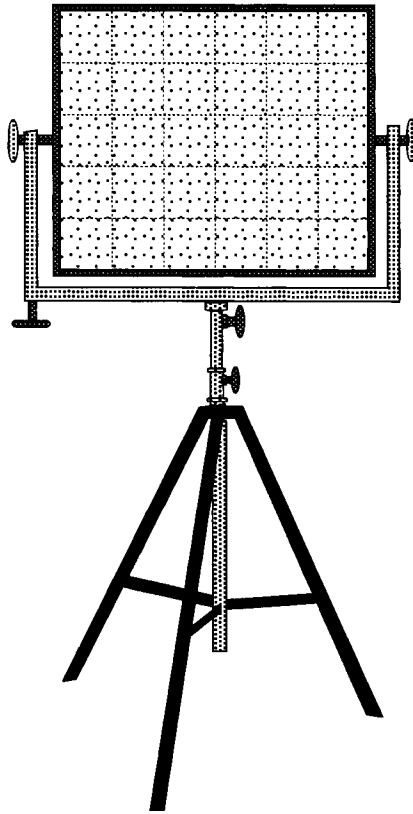


Figure R.1 Reflector board (diffused side)

- rheostat** An adjustable control that uses electrical *resistance* to increase or decrease voltage to *lamps* or other electrical appliances such as motors. Rheostats are often used in *dimmers*. Also known as a potentiometer (pot).
- rifle** A *reflector board* with a highly polished mirror surface. Rifles are used to direct sunlight over distances or around obstacles to other *reflectors* in an exterior or interior *location*.
- rig** Any overhead or grounded assembly designed or adapted to support lights, backgrounds, and lighting accessories.
- rigging** Any supporting structure for lighting that hangs in the air or from the ceiling above the floor or ground, as opposed to being mounted on stands.

righthand rule The practice of setting up a *grip head* so that gravity will exert rotational force tending to tighten rather than loosen it. This means that projecting loads such as *gobo arms* should be positioned on the three o'clock side of any tightened head (grip heads and screws in general tighten clockwise and loosen counterclockwise) so that the head will not work itself loose.

rim light A type of lighting that illuminates only the outline of a subject, often from both sides and to the rear. A rim light (which generally makes a hard rim of light on a subject but doesn't brush along the cheek) provides more *backlight* than a *kicker*. A rim light usually strikes on a level with a subject, rather than emanating from overhead.

ringing (video) A visible defect seen in a video image as a halo of closely spaced dark and light bands outlining the edges of images.

ring light Any compact circular lighting unit designed to fit around a camera lens; used for shadowless frontal fill lighting, particularly in portraiture or *close-up* photography.

riser (1) A tube-shaped extender used to add height to a light stand or camera mounted on a *dolly* mount. (2) A wooden platform used to raise the *set*, lighting instruments, or the camera.

Rocky Mountain leg A sliding leg on a *Century stand* or *combo stand* that allows a steady footing on uneven terrain.

rod/spike See *bull prick*.

roller stand A heavy light stand having a caster on each leg.

rolling shot Any shot that takes place on a trailer or moving platform, used for moving automobile shots.

Rosco A popular manufacturer of *gels*, *smoke machines* and fluid, and other lighting supplies.

rough-in An approximate placement of lights on a *set*. The *DP* and the *gaffer* should have a lighting plan based on previous discussions. The basic procedure for roughing in a lighting setup is as follows: when the gaffer calls for a light, an *electrician* goes to retrieve it; the *best boy* brings power via a *single* or *porcelain*. A *grip* may also be called upon to place *sandbags*, *flags*, special *rigging*, or ladders in place.

roving fill A *fill light* mounted on a *dolly*, which follows along with a moving subject. When the fill is mounted on the camera, it is called a *basher* or *Obie*.

running shot A moving shot that follows the movements of and keeps pace with a character, animal, or vehicle.

runway base A folding wheeled base with a 1-1/8" *receiver*, which can be used to mount a stand *riser* or lighting instrument.

runway stand A *Century stand* with a detachable *runway base*.

rushes See *dailies*.



sandbag A sealed sack of canvas or plastic-coated material filled with sand, lead pellets, or other heavy filler; used as a *ballast* to anchor light stands. Sandbags for production feature a two-compartment design so that they may be easily draped over the leg or around the main column of a lighting or *C-stand*. They also have a strap handle for easy carrying and a steel ring for hanging or receiving a rope. Sandbags are manufactured in 15-, 25-, 35-, and 50-pound sizes. Also called a *silent grip*.

sash chain See *grip chain*.

sash cord A cloth rope or line, similar to clothesline, used in production, available in size No. 8 and the heavier No. 10. Sash cord is frequently used for tying off *silks*, safety lines, and nearly all general *rigging*. Heavier jobs such as rigging block-and-tackle require the use of regular hemp rope.

saturation (of color) The purity or degree of dilution (by white light) of *hue* in a color. Saturated colors are strong and vibrant and often contrasty, whereas desaturated colors appear as pastels. White, black, and gray have zero saturation by definition.

scaffolding See *parallels*.

scene brightness ratio The difference between the brightest and the darkest elements within a scene when expressed as a ratio or a range of *stops*. For example, if the brightest point in a scene has 128 times more *luminance* than the darkest point (seven stops), it can be said to be a seven-stop scene brightness ratio.

scissor clamp A small mounting device for hanging lightweight fixtures from a drop ceiling. It consists of a 5/8" pin with two pivoting flanged blades that clip onto the crossed metal frame pieces of a drop ceiling system. Also called a *drop ceiling hanger*. See figure S.1.



Figure S.1 Scissor clamp. Courtesy of Matthews Studio Equipment, Inc.

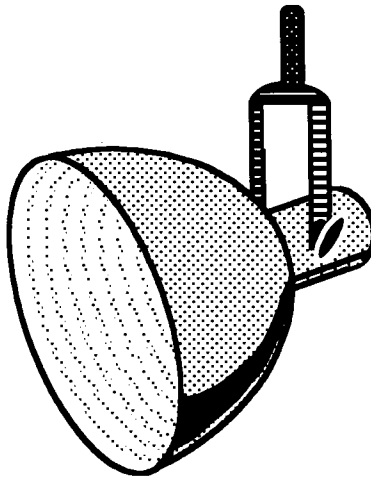


Figure S.2 A scoop

scoop A *studio* fixture, named for its large bowl-shaped *reflector* (which also serves as the housing). It produces an excellent, soft light over a widespread area; however, the scoop is used infrequently on *location* because it is generally heavy and cumbersome, and its light is difficult to control. See figure S.2.

screen direction The direction of a subject's movement on the screen.

scrim A small wire-mesh *gobo* used as a nonelectrical *dimmer*, held in the front brackets of a fixture. The scrim cuts the *intensity* of a

beam without greatly diffusing it. Scrims are available in single-mesh (reducing transmitted light by one *stop*) and double-mesh (cutting light by two stops) weights; each may be identified by a color code. Each is available in half-mesh as well as full-mesh weights. Scrims are sometimes referred to as “wire” or “metal.” Compare *net*. See figure S.3.

scaled beam A *lamp* design that combines a parabolic *reflector*, a lens, and lamp *filament* in a single self-contained unit. See also *PAR*.

seamless paper A smooth wide heavy paper available in different colors in rolls measuring up to 12' x 100'. Seamless paper provides an inexpensive *backdrop* or *cyclorama* when suspended from a high bar and rolled down to the floor.

SeaPAR A watertight 1,200 *watt HMI PAR lamp*. The SeaPAR, used for underwater film and video work, can withstand depths up to 220 feet in salt water. Because it is necessary to change lamps in order to change the focus of PARs, the bulbs are designed to be interchanged underwater. The *ballast* is equipped with a 20 *amp* grounded fault interrupter and operates above water.

SECAM A television format used in France and Eastern Europe, utilizing 625 scan lines and a frame rate of 25 fps.

second AC See *assistant camera person, second*.

secondary color One of the *subtractive primaries*: namely *cyan*, *magenta*, or *yellow*.

secondary feeder A length of *cable* that clamps to a *distribution box* and ends with a number of fused receptacles.

secondary key A light that serves as an actual *key light* despite the presence of a primary motivated key, which may not actually provide adequate *illumination* for the subject. An example of this would be a key that illuminates an actor wearing a brimmed hat;

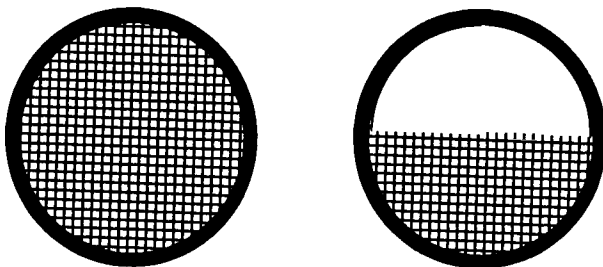


Figure S.3 Full and half scrim

in this case, the key casts a shadow on the face. A secondary key would provide the needed illumination to light the face.

second electric See *best boy*.

second grip See *best boy grip*.

second unit An ancillary camera unit responsible for shooting any scenes that do not include the main actors, such as establishing shots, sunsets, car chases, or stunts. Often the second unit is responsible for shooting the most visually arresting images of a feature film.

SED graph A chart that plots a graphic display of the *spectral energy distribution* of a light source. The graph depicts the relative energy or strength of the various wavelengths or *hues* comprising the spectrum emitted by the source. See figure S.4 (page 140).

Sekonic A Japanese manufacturer of a popular line of *incident light meters*.

semi-silhouette A figure, about two *stops* under a normal *exposure* and against a light background, that appears dark but still retains some detail.

senior A 5,000 *watt Fresnel* fixture.

senior stand A reinforced *junior* stand specially rigged for large fixtures such as a 5K, 10K, 12K, or *big eye*.

separation light Any light that strikes a subject from the rear, making the subject stand out from the background.

sequence shot A long take or *master shot* of an entire scene, often used in its entirety in the completed film in place of traditional coverage by *close-ups*, medium shots, and insert shots.

series 80 filters A *Wratten* designation of blue *filters* used for converting 3,200 K light to 5,500 K light. See also *tough blue*.

series 85 filters A *Wratten* designation of orange/amber *filters* used for converting 5,500 K light to 3,200 K light. Used for filtering *day-light* to match *tungsten-balanced* film. See also *CTO*.

set A construction designed for the convenient lighting and shooting of scenes.

set light A term used in television production meaning *background light*.

setup (1) The arrangement of the camera and what it sees in a particular shot, including scenery, *props*, actors, and lighting. (2) In video, another term for *black level*. See also *pedestal*.

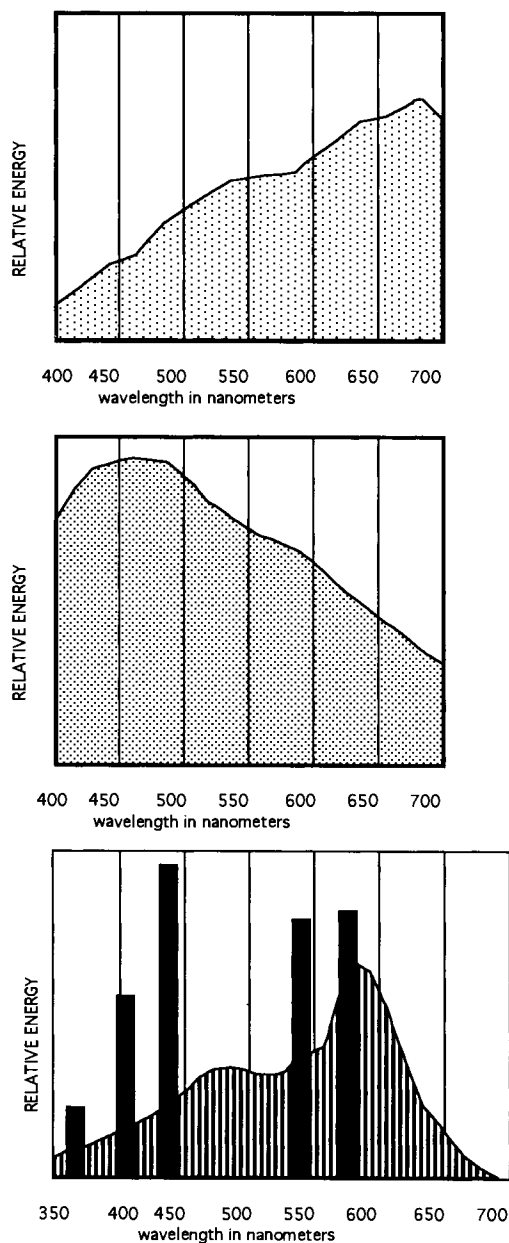


Figure S.4 Spectral Energy Distribution (SED) graphs. Tungsten (top), daylight, and fluorescent light (bottom).

seven-fifty A 750 watt tungsten-halogen lamp.

shadow projection device A *spotlight* or *ellipsoidal fixture* designed to project a *pattern* (such as tree foliage or venetian blinds) onto a background.

shake 'em up, to (verb) A command to refocus *reflector boards* at the beginning of each take.

shiny board A large rectangular panel with one highly reflective and one soft reflective surface, pivoting in a yoke held by a heavy stand. Used to fill in or augment sunlight on exterior shoots. See also *reflector board*.

short arm A *gobo arm* that measures 20" in length.

shoulder The part of a film's *characteristic curve* where the *straight line* slope rolls into a horizontal position; where all *values* crush together and translate as white. Also referred to as the *knee*.

show card A graphic arts or illustrators' board generally measuring 32" x 40" x 1/16". Show cards usually have one white and one black surface. It can be curved to make an impromptu *reflector*, or for a more focused bounce, a show card can be used as a *flag* or cut up to make *cookies* or custom-made *gobos*. The heat-resistant card may also be cut up and used as a *barndoor* extension.

shower curtain A thin *translucent* vinyl material hung in front of a source to diffuse the light.

shutter (1) A device in the camera between the *aperture* and film that prevents light from entering the camera while each frame is pulled down into the film gate for *exposure*. A motion picture camera sometimes uses a variable shutter with two rotating discs and cut-away openings that allow a varying amount of light to reach the film during exposure. (2) A slatted frame that opens and closes like venetian blinds, used for mechanical dimming of lights without the changes in *color temperature* associated with electrical *dimmers*.

shutter speed The length of time that the *shutter* is opened to allow the *exposure* of a single frame of film.

Siamese connector A *splitter* that divides a power line in two parts. It is used to send power to more than one location.

side arm A lighting extension arm bearing a clamp on one end and a *baby* or *junior* mount on the other. The side arm can extend an instrument away from the stand and also may be clamped on the column, allowing a wide range of low-angle fixture positions. See also *offset arm*.

side light Any light that illuminates a subject at 90 degrees from the axis of the camera, from the left or right.

silent grip Slang term for *sandbag*.

sider An improvised *flag* positioned along the side of a fixture. Also called an *ear*.

silhouette Dark figures and shapes appearing in *contrast* against a light background. Silhouettes generally show very little detail.

silk A *diffuser* consisting of a *translucent* fabric stretched on a frame, normally mounted on a *C-stand* or *roller stand* in front of a fixture or the sun. Silk is also a term for any cloth material that has a bright translucence. Taffeta, an artificial fabric, is finding greater use, being more durable than traditional China silk. Heavier *opaque* cloth of cotton or nylon is called *muslin*.

silver bullet A *Fresnel lamp* consisting of an unpainted aluminum housing and a 12,000 *watt HMI* lamp. Also called a *silver streak*.

silver halide crystals A generic term for the light-sensitive salts used in photographic *emulsions*. The halides make up the *grain* in the developed film.

silver streak A 12,000 *watt HMI lamp* having an unpainted aluminum housing, manufactured by the *Mole Richardson Company*. Compare *silver bullet*.

single (1) A single 12-gauge with *bubble plugs*. (2) A single- mesh *scrim*. (3) A single-mesh *net*. (4) A 12/3 or 12/2 cable; also known as a *stinger*.

single extension cable An electrical extension *cable* used for powering one instrument, as opposed to a *splitter*.

single-pole switch An electrical switch having only one blade and one contact for opening or closing one side of a *circuit*.

6K A 6,000 *watt HMI* fixture with a *Fresnel* lens.

skypan The largest open-faced fixture available, consisting of a bare bulb housed in the center of a large shallow white aluminum *reflector*, for wide, even *illumination* of flat smooth surfaces. The same fixture may use a 5K DPY or a 2K CYX *globe*. Only two accessories are available for the skypan: a skirt to contain some of the *spill* and prevent lens *flares*, and a *gel frame*. See figure S.5.

Originally used for lighting *cycloramas* and *backdrops*, the skypan is now used for any application where large areas need to be lit with intense illumination. One common use is to hang the fixture from a *grid* over a *butterfly* or *overhead* to create a giant soft light.

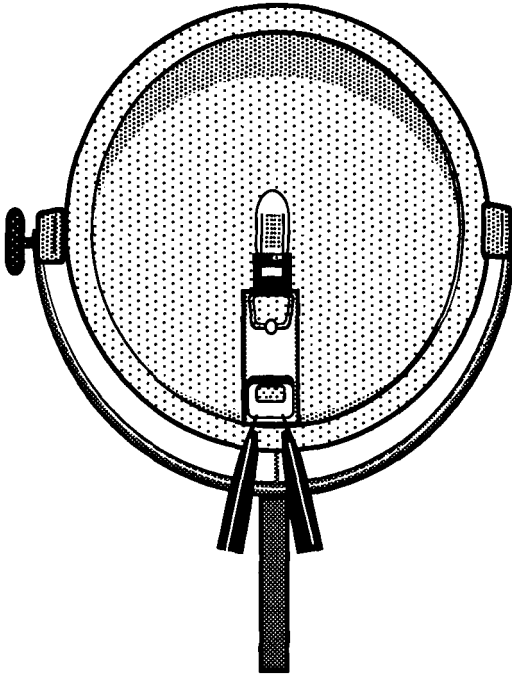


Figure S.5 A skypan fixture

sliding leg See *Rocky Mountain leg*.

slip on A 4' x 4' *single* or *double net* with elastic bands at each corner, designed to fit over the hard side of a *shiny board*. It must not be used on the *soft side*, because it will wear away the *leaf grid* that is lightly attached to the face of the board.

slip pin A type of high *ampacity* connector used for *feeder cable* and a power connector of large lights.

smilex See *dingle*.

smoke machine A device that generates a thick *fog*, for use in creating diffuse atmospheric effects.

SMPTE Society of Motion Picture and Television Engineers. The organization of engineers in both the film and television industries, which sets the standards for film and film equipment for the American National Standards Institute (ANSI). The group publishes *The Journal of the Society of Motion Picture and Television Engineers*.

snoot A flanged tube- or funnel-shaped accessory that fits over the front of a fixture and focuses the light into a small circle. Snoots are used to highlight and isolate selected areas in a scene, such as a single table in a nightclub. When a snoot is not available, one may be improvised with a heavy flat black foil known as *black-wrap*. See figure S.6.

sodium lamp An industrial *discharge*-type *lamp*. Because they emit light of a discontinuous spectrum, they are not often used in production. *High-pressure sodium lamps* are used to illuminate boulevards and parking lots. As they emit light primarily in the yellow wavelengths, they are easily recognized by their familiar orange-yellow color. Low-pressure sodium lamps, used widely in Europe, exhibit a similar amber-colored light. No amount of filtering can even out the spectrum of low-pressure sodium lamps.

soft box A large box containing several *tungsten-balogen* or electronic flash *lamps* covered with a *diffusion* material. Soft boxes are often homemade and provide a great amount of nearly shadowless soft light.

soft focus A diffused image effect obtained by use of an appropriate diffusing material or special lens.

softlight An open-faced fixture, featuring one or more indirect *lamps* housed in a large *reflector*, which produces a highly diffuse, nearly shadowless light. See figure S.7.

softside The relatively diffused side of a *sbtny board*.

solid A large black *flag* used on a *butterfly* stand.

sound stage An enclosed quiet environment with ample electrical power, smooth floors, and high ceilings to accommodate a lighting *grid*, *catwalks*, and numerous instruments. It allows the construc-

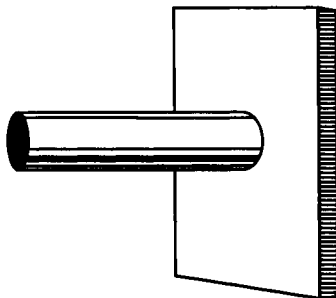


Figure S.6 A snoot

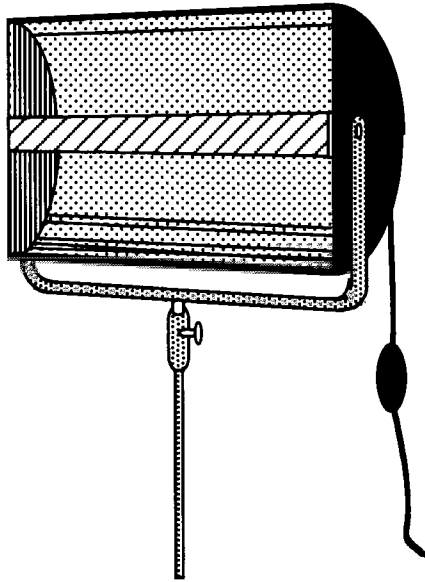


Figure S.7 A portable softlight

tion of almost any kind of *set* desired and enables the *director of photography* to create practically any style of lighting to suit the mood of the production. A few fundamental differences exist between the traditional film sound stage and the television *studio*. The television studio is generally equipped to facilitate several cameras operating simultaneously via an adjacent control booth. This multicamera mode of production places limits on any lighting plan, as lighting must be general enough to satisfy several points of view at once. Also, television studios are often by necessity multiuse facilities. For instance, a television studio may be used to tape a talk show in the morning, an instructional show in the afternoon, and a live audience program in the evening. Since the lighting must be changed quickly for each show, instruments are usually mounted on an overhead grid, a lattice of pipe suspended from the ceiling.

Multicamera shoots dictate a more generalized overall lighting plan than do single-camera film or EFP shoots, because lighting must be sufficient for all camera vantage points. In general, light stands, which tend to clutter the floor and inhibit the mobility of cameras, are eschewed in favor of scissor-type extendible *pan-tographs*, which allow instruments to be brought down close to the

subject and moved quickly out of the way when not needed. *Scoops* are often used to provide an overall fill known as *base light* in order to provide a minimum *footcandle* level. Lighting plans are plotted out for each show so that each lighting scheme may be restored prior to taping a given program.

The motion picture studio or sound stage is usually host to one production at a time, though very large buildings may house several sets in different areas simultaneously. The building may be an actual designated studio building or simply a large rented warehouse. Often catwalks (narrow walkways high above and circumscribing the floor area) allow technicians ready access to fixtures without the need to intrude upon sets. Light stands are used frequently; on many sound stages, fixtures are simply mounted high on stands behind *flats* or affixed directly to tops of set walls. Because each shot is photographed from one camera point of view, lighting may be set specifically for virtually any effect desired by the *director* and *cinematographer*.

sound stage catwalks The elevated walkways that run the perimeter (and sometimes traverse) the walls of a *sound stage*.

spag bag A wedge-shaped *sandbag* used to prop up a camera on the ground.

spar fiblets See *stand adapter pin*.

spark Slang for *electrician*.

specialized lights A general term for special-purpose lighting instruments, including *eyelights* and *hairlights* used for fine tuning the lighting of a scene.

spectral energy distribution The relationship of light wavelengths to each other. See also *SED graph*.

specular Highly reflective, mirrorlike; said of a surface. Also, any bright *highlights* reflecting from such a surface.

specular highlights Intense, bright spot *reflections* from objects with highly polished, mirror-like surfaces.

speed (1) Referring to the light-gathering potential of a lens, expressed as its maximum possible *aperture*. (2) The light sensitivity of a film *emulsion*, expressed as *exposure index (EI)*. (3) The frames-per-second rate of a motion picture film.

spherical A round mirror *reflector* that directs light in all directions.

spill See *spill light*.

spill light Undesirable *illumination* that scatters outside the desired beam of a *lamp*.

splicer A single piece of *cable* that has one plug at one end and two (called a “Y”) or three (called a “W”) receptacles at the other end.

splitter An electrical extension cord that ends in a *utility box* with two or four sockets.

spot, to (verb) To focus *illumination* of a fixture on a small area.

spotlight Any *luminaire* capable of projecting a focused beam in a circular pattern.

spot meter A type of handheld *reflected light meter*, fitted with a lens that allows only a very narrow *angle of acceptance*, usually from .5 to 5 degrees. Because the measuring angle is so small, spot meters also have a viewfinder, usually of single-lens reflex design. They are capable of giving accurate readings of small portions of a scene. They will also measure *flesh tones* from great distances, making them ideal to use with long camera lenses.

Spot meters are ideal in situations where taking *incident light* readings would be inconvenient or impossible, as at a concert or other event.

spray oil A light oil used to lubricate any moving part, to prevent squeaks or noise that may occur during a take.

spud A 1-1/8” pin affixed to the center of the yoke of an instrument that fits into a receptacle on a light stand or clamp, used to mount *junior* and larger fixtures.

spud adapter See *stand adapter pin*.

spun glass Fiberglass sheeting used as a *diffusion* material. See also *tough spun*.

sputnik A device placed on a camera *dolly* that allows the camera and operator to rotate a full 360 degrees.

stage box A *distribution box* having six receptacles for *stage plug* connectors.

stage plug An electrical connector that fits into a square plug receptacle and consists of a fiber block with two copper plates, one on either side and one of which is spring loaded. Stage plugs are difficult to ground, slip out of connection easily, and are generally dangerous to use because their open hole design invites electrocution. They are still found in old stages, but are gradually falling out of favor.

staging A location for temporary storage of working equipment.

stand adapter pin Often called a *spud adapter*, this unit consists of a pin with a 1-1/8” base and a 5/8” pin on top. This pin fits into a

combo stand or a *high roller* with a receptacle if an adapter is needed. Also called a *spar fible*.

standard candle The amount of light given off by a single candle; a measurement superseded by the *candela*.

standard incandescent lamp A *lamp* consisting of a *tungsten filament* set in a screw-type base with a large glass *envelope* filled with nitrogen gas. Also called *household bulb*. Compare *tungsten-halogen lamp*.

stand extension An accessory that adds extra height to various light and *grip stands*. The extension attaches directly to a 5/8" or a 1-1/8" *receiver*, depending on the style. Stand extensions have a 5/8" pin and can be 3", 6", 9", up to 18" long. *Junior* stand extensions usually come in 36" lengths and terminate in a 1-1/8" receiver.

star filter An optical *effects filter* that produces the effect of four-, six-, or eight-pointed "stars" around any point-like light source or *specular reflection* in an image.

step lens A lens that shares some of the properties of the *plano-convex lens*, with much of the bulk of that lens eliminated through the use of a graduated-step cutaway design. The step lens was developed to lessen the weight and heat retention properties of the plano-convex lens. It is, nonetheless, a very heavy lens used mostly in theater and stage applications, in *follow spot* and other similar fixtures.

step-up, or stair, block A block consisting of three 2" x 4" pieces joined together, convenient for raising, propping, and wedging tables, couches, and other items. Each step is approximately 2" higher than the last, with approximately 4" between steps.

Stik-up A small 100 *watt incandescent lamp* with snap-on *extension arms* and clips, often used to simulate light from a candle or an automobile dashboard. A trademark of the Great American Market. See also *peanut*.

stinger A *single extension cable*, consisting of a length of 12/3 with *Tri-Edison plugs* at either end.

stirrup A stirrup-shaped accessory that fits on the end of a telescoping or other hanger, for affixing lighting instruments.

stock Raw motion picture film that has not been exposed. Also called *raw stock*.

stop down, to (verb) To close down a lens, by adjusting the *iris* to a smaller *f-stop* or *t-stop*.

stop A shortened term for *f-stop* or *t-stop*.

storyboard A series of drawings, similar in appearance to a comic strip, representing each shot in a production. Storyboards are crucial to previsualizing the look and continuity of a film.

straight line The portion of a film's *characteristic curve* where *E log* differences are given proportional differences on the *density* axis. *Luminances* pegged to the straight line will be accurately represented in the film image.

Strand Strand Lighting, an international supplier of film, television, and theatrical lighting equipment. A subsidiary of the Rank Organisation.

Streaks'n'Tips An aerosol hair-coloring spray sometimes used by *grips* and *cinematographers* as an appliqué to dim the *intensity* of *practical* lamps. It is also used to age fabrics and *props*. A trade name.

striplight A single narrow lighting unit that contains a row of open-faced *luminaires*, usually 1K or 1.5K units, to illuminate *cyclo-ramas* and other backgrounds. Their primary characteristic is the asymmetrical throw that focuses more *illumination* on the top or bottom of the cyc. See figure S.8.

strobe An electronic light source capable of emitting light in very short bursts. Useful for freezing motion. Used primarily by still photographers.

stud adapter An adapter that has a 1-1/8" on one end and a 5/8" on the other, used for mounting a *baby* or other small fixture on a *junior* stand. Also called a *Frisco pin*.

studio See *sound stage*.

studio overhead grip arm An overhead *C-clamp* that terminates in a *Century stand*-like *grip head* with an *extension arm*; it can be clamped onto a pipe or a *grid* to hold *flags*, *grips*, and other *gobos*.

subject lighting ratio The difference in *luminance* between the key and fill sides of a subject, which may be measured in one of two



Figure S.8 Striplight

ways: (1) key plus fill/fill alone, or (2) key/fill. The lighting ratio of a subject's face is sometimes called the *facial ratio*.

subject luminance range See *luminance range*.

subject plane The main portion of a scene, usually in the middle-ground, where the subject resides; often considered to be the most important part of the shot. Other important planes of the scene are the *background plane* and the *foreground plane*.

subtractive primaries *Cyan, magenta, and yellow*, the secondary hues of *white light*, composed of combinations of *additive primaries*. Cyan comprises equal amounts of blue and green, magenta is made up of equal amounts of red and blue, and yellow consists of a combination of equal amounts of red and green. Subtracting one of these colors from the spectrum is equivalent to adding its complementary primary. For example, removing yellow from the spectrum is equal to adding blue.

subtractive process A method of printing color images by filtering out undesired parts of the spectrum from *white light*. This process is the one used in printing negatives in still and motion picture photography.

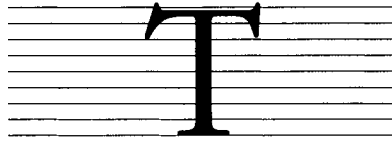
suction cup A rubber suction cup fitted with a housing and 5/8" pin in single or double configurations. A cam-operated lever creates the suction effect, useful for mounting lightweight fixtures to non-porous surfaces such as automobile hoods or windows.

sun gun A generic term for any portable *battery-powered lamp*. A sun gun may use a standard *tungsten-halogen* or an *HMI lamp*. *Tungsten* sun guns generally use 12 volt or 30 volt lamps and operate from battery belts. Converted *Lovel Omni* and *DP lights* are the most popular units used as sun guns. As a rule, a tungsten sun gun will operate for a maximum of twenty minutes. HMI sun guns are *daylight* balanced, they offer greater efficiency than tungsten-halogen models, and they boast longer battery life as well. Because battery time with tungsten or HMI is extremely limited, it is always wise to carry plenty of the portable power sources along whenever possible.

super crank An extra-heavy-duty *crank-o-vator* with 10" pneumatic tire wheels that can withstand a load of up to 200 pounds, used for *12K* and *carbon arc* fixtures.

switch A device for making or breaking a contact in an electrical *circuit*.

swivel U-hook An accessory that snaps onto a *mafer clamp* and holds cords, *sandbags*, or anything else requiring a hook.



tabular grain A recent development in improved *emulsion* formulation that utilizes a flatter, tablet-shaped grain structure. Tabular grain affords greater image resolution because it conforms more to the narrow *depth of focus* at the *film plane*.

tachometer An instrument that measures a motor's relative speed in revolutions per minute.

take down, to (verb) To reduce *intensity* of light on a subject by means of *nets* or *scrims*.

talent Personnel employed as performers in a film or television production.

target (1) The area of light sensitivity of a *video CCD* or *pickup tube*, where the image is focused. (2) A circular *flag* 3" or larger that may be of *opaque*, *net*, or diffuse material and is used to intercept a portion of a light beam.

T-bar A 40" stainless steel tube with an outside diameter of 1-1/4" and a 1-1/8" pin, used to hang lighting instruments with *pipe clamp* mounts. The T-bar is generally used in conjunction with a *roller stand*.

T-bone A T-shaped metal base plate with a 1-1/8" *receiver*, used for mounting *junior* and *senior* lighting fixtures low to the ground. T-bones are often nailed or screwed to a stage floor or wall and come with an attached safety chain. See figure T.1 (page 152).

teaser A large black cloth screen for controlling soft light, often put on stands or hung over a *set*.

tech down, to (verb) A method of treating costumes and draperies to reduce their reflectivity. A common practice is to rinse white fabrics in weak tea in order to give the material a more aesthetically pleasing warmth. The term is derived from Technicolor, the company that reputedly popularized the process.



Figure T.1 T-bone. Courtesy of Matthews Studio Equipment, Inc.

Ted Lewis A highly malleable *snoot*, named for the top hat worn by the venerable vaudeville entertainer.

teeny A compact open-faced fixture with a 650 *watt lamp*.

teeny-weeny A compact open-faced fixture with a 600 *watt lamp*.

telescoping hanger A device used for hanging a fixture from an overhead *grid* pipe, extending the instrument well down into a *set*. The hanger can be adjusted for length while permitting a pivoting movement around the vertical axis of the *C-clamp*. Single hangers have a maximum length of 3', the double telescopes from 3' to 6'. The hangers end in a 1/2"-13 *female* thread, into which a *stirrup* or other accessories can be bolted.

10K A 10,000 *watt Fresnel* fixture. The 10K comes in one of three forms: (1) the relatively compact, easily transportable *baby* 10K, with a 14" *Fresnel* lens, (2) the standard 10K with a 20" lens, called a *tenner*, and (3) the *big eye* *tenner*, which carries a 24" lens. The *big eye* is remarkable for the quality of its cast light, which combines the *specular* quality of a small lamp with the wrap-around quality of a large *radiating source*. This translates to a punching bite with a long throw, tempered by a diffuse softlight look on subjects close to the cast light.

tenner A 10,000 *watt Fresnel* fixture of standard dimensions, as opposed to a *baby* 10 or a *big eye*.

three-pin connector An electrical connector commonly used in *studio* applications, so-called because its three contact points take the form of cylindrical prongs.

three-point lighting A traditional portrait lighting formula, characterized by the use of *key light*, *fill light*, and *backlight*.

through-the-lens (TTL) light meter Essentially a *spot meter* built into a camera body. With the advent of reflex cameras and *zoom lenses* with reflex viewing systems, it was a natural step to place a tiny light-sensitive cell in the reflex light path and thus constantly monitor the brightness of the scene as viewed by the camera itself. This has evolved into the fully automatic *exposure* system wherein the *CdS cell* controls a *current* powering a tiny motor that instantly sets the *aperture* (or *shutter speed*).

There are two important drawbacks to this system, due to its uncritical reliance on the basic *reflected light meter*. First, because this system gives essentially an integrated reflected light reading, it does not produce consistent *flesh tones* due to changes in backgrounds and objects surrounding the subject. Second, when a camera pans from a dark scene to a lighter one, the result is often a distracting and abrupt aperture change. Hence, most professionals do not use through-the-lens meters for film and EFP work, preferring instead the greater flexibility of handheld meters.

tie-in A temporary power feed clipped on to a service *main*, used to centralize wall *current* at a single distribution point. Tie-ins can be hazardous and are outlawed in many areas.

Tiffen A manufacturer of motion picture camera *filters*; also, such a filter.

tilt A camera movement performed by pivoting the *tripod* head up and down; a vertical pan.

tilt plate A camera mounting unit that allows normal and tilt configurations, generally used in *car rigs*.

Time Square clamp See *furniture clamp*.

timing (1) The process of manipulating the *density* or *color balance* of a film from shot to shot in order to achieve continuity and overall cohesiveness. Initial decisions regarding this process may be made by a specially trained technician called the timer, who uses a video color analyzer called a *Hazeltine* to view and make corrections directly from viewing the negative. Black and white films may be timed by changing the size of the *iris* slot, by adjusting the light with a valve, or by using a moving band with diaphragm holes of different sizes. Timing for color films generally employs a subtractive color process. Decisions for changes may be decided upon by discussions between the laboratory "timer," the *director of photography*, and the *director*. In an additive printing process, the light is divided into the three primaries by *dichroic filters*, the *intensity* of each beam is adjusted, and the three are combined again before they enter the *aperture*. Coded perforated tape, which can be cre-

ated by the video analyzer, is employed to change each valve that controls one of the primary colors from setting to setting so that all the scenes can run continuously through the printer. (2) Also, determining the exact or approximate duration of a shot of scene.

Titan A 350 amp carbon arc fixture.

toe The lowest portion of a film's *characteristic curve*, where all *values* reproduce as black. Any part of a dark value of shadow that falls on the toe will appear *blocked up* in the image, without detail.

top-chop See *topper*.

toplight A light aimed straight down at a subject, often used to create an overall base *illumination*. Key lighting is rarely used in the form of a toplight except when a harsh effect is desired, as in a science fiction or horror film.

topper A *flag* mounted over a light source to block top *spill light*. Also known as a *top-chop*.

Tota-lite A compact, exceptionally wide angle 750 or 1,000 watt *tungsten-halogen* broad fixture featuring a folding gull-wing *reflector*. The Tota-lite, which produces a smooth, efficient light pattern, is generally used as a bounce source. Designed to accommodate a wide range of accessories, including umbrellas, *gel frames*, and *flags*, it can also be easily tucked away in tight spaces or used in groups as a *cyc light*. Two Tota-lites can be combined by inserting the *male* end of the stand clamp into the *female* side of the other fixture. See figure T.2.

tough blue A blue *filter*, used to convert warm *tungsten* sources to *photographic daylight*. Tough blues are most often used to balance tungsten lights inside a room with the daylight blue window light flooding in. A problem with using tough filters to "blue" lights is the loss of light *intensity* due to the relatively low *transmission* rate of 36 percent. This translates to a 1.5 *stop* of light loss as opposed to a .67 stop loss with a *CTO* (amber filter used for converting cool daylight to warm tungsten). The biggest drawback is that tungsten is quite weak compared to the combined light of the sun and sky. The most popular alternative is to *gel* the windows with CTO and neutral density in order to match the *color balance* and intensity of the tungsten sources rather than the other way around. Also called *full blue* or *CTB* (*color temperature blue*).

tough spun A thin, supple, synthetic *spun glass* sheeting, used as *diffusion*, especially over open-faced fixtures. Tough spun is much less irritating to the skin than traditional spun glass and is highly heat resistant.

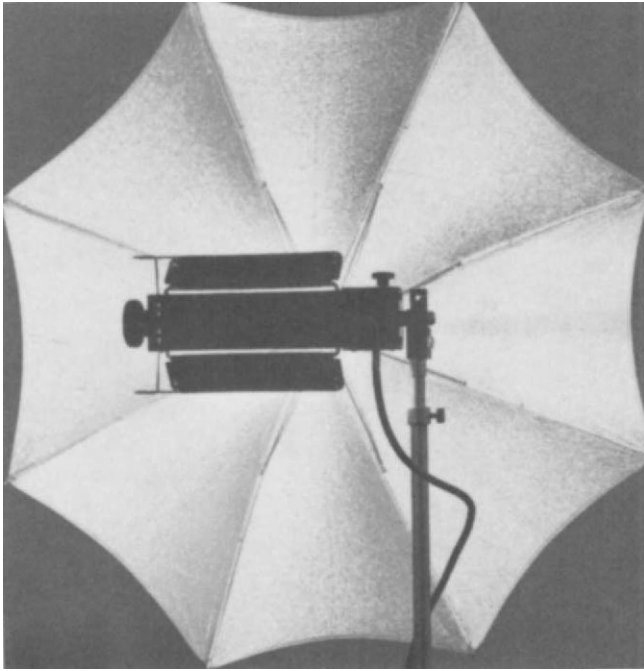


Figure T.2 Tota-lite with umbrella. Courtesy of Lowel Lighting, Inc.

tracking A rolling camera movement, performed on a wheeled vehicle often riding on tracks.

transformer A device that increases or decreases the flow of *current*.

translite backing A scenic backing for windows and doors prepared from large photographic enlargements and lit from behind to give the illusion of a cityscape or panorama.

translucent An object, material, or vapor that both transmits and scatters light in varying degrees.

transmission The degree to which a *translucent* medium allows light to pass through it. *Filter gels* are often rated to their degree of transmission. Also, the act of (light) passing through a translucent substance.

transparent An object or material that transmits clear light and images without noticeable *diffusion*.

transverse wave A wave in which the electric field moves perpendicular to the line of light travel.

trapeze A mounting accessory that allows a light fixture to descend into a *set* by means of a rope or chain through the canter loop. Each end of the trapeze has a ring through which a rope is placed to position and secure it. The center *receiver* is 1-1/8", which may be converted to 5/8" if desired. See figure T.3.

tree Short for *Christmas tree*.

trial print See *answer print*.

trick line A heavy-duty string approximately double the weight of a common shoelace. Trick line is much lighter than *sash cord* and is used for tying *cable*, securing lightweight items, and other uses.

trick up, to (verb) To install or attach; "trick up a *gel*."

Trico A common electrical connector available in 60, 100, and 200 *amp* sizes (referred to as No. 1, No. 2, and No. 3), used for electrical *tie-ins*.

Tri-Edison A common grounded electrical connector found in home and industry, consisting of two flat tines and a cylindrical ground contact.



Figure T.3 Trapeze. Courtesy of Matthews Studio Equipment, Inc.



Figure T.4 Trombone. Courtesy of Matthews Studio Equipment, Inc.

trim A fine-adjustment focusing of lights.

triple header An extension accessory similar to a *double header*, with the addition of an extra *receiver* or pin, to allow the mounting of from two to five fixtures, especially useful for creating a *bank* of lights. Compare *double header*.

tripod A three-legged camera support.

trombone An extendible tubular hanger for suspending lights from *set* walls. A tennis ball fitted over the telescoping shaft keeps the mount from marring the wall surface. See figure T.4.

T-stop A marking on some motion picture lenses, in addition to or instead of *f-stop* markings. The "T" stands for *transmission* and indicates the effective f-stop in terms of light-passing power. That means that the light passing through that particular lens was measured and calculated and that those settings are to be used rather than their theoretical f-stop equivalent.

tube dolly A specialized *dolly* originally designed to ride on sections of straight standard *dolly track* of tubing. The tube dolly was created to serve as a tracking platform for the older conventional *crab dollies*, which were not adaptable for track use.

tube stretcher Extenders made of pipe that fit inside a *wall spreader*.

tubing hanger A hanger used to support overhead frames of other types of *rigging*. One end fits into a 4-1/2" *grip head*. The opposite terminates in a clamp designed to hold pipe of 1-2" diameter tubing.

tungsten A white metallic element that withstands extremely high temperatures without melting, commonly used for *filaments* in *incandescent lamps*.

tungsten-balanced film A film *emulsion* designed to be exposed under *tungsten* light without a *filter*, or under *daylight* in conjunction with a #85 filter.

tungsten-halogen An *incandescent lamp* featuring a *tungsten* filament in a small quartz *envelope* filled with regenerative *halogen* gas. Tungsten-halogens have a longer useful life than standard incandescent lamps and are capable of higher wattage levels than standard incandescents.

tungsten incandescent lamp A lamp incorporating a heat-resistant *tungsten filament* that glows and emits heat when electricity flows through it.

turnaround (1) A reverse-angle shot, which involves a change in lighting setup. (2) A double-ended electrical connector used for

reversing the direction of connectors on a power line. (3) In production, the duration between wrap and call-time the following day, usually allowing ten hours for sleep, meals, and transportation time.

turtle A squat, self-supporting three-legged mount with a *junior* receptacle, for mounting fixtures at low angles.

TVMP adapter An adapter with an outside diameter of 1-1/8". One end converts *junior receivers* so they accept 5/8" pins and the opposite end has a 1/2"-13 thread. It is used to convert theatrical-type hanging fixtures to motion picture stand mounts.

tweco An electrical connector similar to a *slip pin* connector, often used with *feeder cable*.

tweenie A small *Fresnel* fixture, housing a 650 *watt lamp*.

twelve-by A 12' square *silk* or *net*, used as a *butterfly*.

12K A 12,000 *watt HMI* fixture. One of the most powerful *lamps* available, the 12K is the instrument of choice to simulate sunlight and as a fill to balance the harsh brilliance of actual sunlight. The 12K has largely supplanted the *carbon arc Brute* in most situations. See also *HMI*.

twelve-three A 12-gauge three-conductor electrical *cable* with Edison connectors at either end. Also called a *stinger* or a *single*.

twenty-by A 20' square *silk* or *net*, used as an *overhead*.

20K A 20,000 *watt Fresnel* fixture, seldom used.

twilight zone A period of intense full moon *illumination* at night, where the human eye is more sensitive to blue than to reds and yellows; this creates what is known as the *Purkinje effect*, which makes moonlight appear blue to most observers.

twist-lock An electrical connector employing three curved blades or slots. The *male* plug and the *female* receptacle fit together and lock with a twist-rotating motion (hence the name) and prevent accidental disconnections.

2K A 2,000 *watt Fresnel* fixture, usually with a *tungsten-halogen lamp*, commonly called a *junior*.

211 bulb A 75 *watt* medium base enlarger bulb that features a special bonded ceramic coating for even and soft light.

216 diffusion A sheet *diffusion* material, used in frames and for softening *softlights* and large lights.

212 bulb A 150 *watt* medium base enlarger bulb that features a special bonded ceramic coating for soft and even light.

U

ultraviolet (UV) An invisible wavelength of light beyond the violet portion of the *visible spectrum*. Although ultraviolet or UV radiation is not visible to the human eye, it may *expose* film and cause damage to the eyes and skin. UV rays are transmitted by *HMI* lights and must be filtered out or else performers may experience sunburn.

ultraviolet filter A *filter* that blocks ultraviolet radiation. Ultraviolet (UV) filters are often used on camera lenses to cut haze in distant landscape shots. Because they absorb little visible light, they are often left in place at all times as a lens protector. UV filters are also used with *arcs*, *HMIs*, and sometimes fluorescents to cut out the ultraviolet radiation emitted by those light sources. *HMI lamps* emit very high amounts of ultraviolet radiation, which may cause severe sunburn and possible eye damage in subjects. Therefore, *HMI* fixtures are fitted with special UV filter lenses; and under no circumstances should an *HMI* be altered to operate without this lens.

umbrella reflector A collapsible device similar in design to an umbrella, usually having a mirror-like surface on its underside, used as a portable and highly effective *reflector* for open-faced and other type lighting fixtures.

underexposure A film image defect produced by shooting at too small an *aperture*, which places the *exposure* too low on the *characteristic curve*. Underexposed images are dark, murky, and muddy, with severely *blocked-up* shadows and little detail in the medium and dark *values*. Underexposure is sometimes used deliberately to evoke a brooding mood or to create a *day-for-night* effect.

union connector A sophisticated *three-ptn* electrical connector that features a secure locking device.

unmotivated light Light that does not appear to emanate from natural or logical sources. The lighting in *studio* films made before the

1960s, such as those by Alfred Hitchcock (e.g., *Rear Window*) looks rather unconvincing by today's standards, because the multiple-source studio lighting popular at that time is largely unmotivated and does not resemble *daylight*.

utility box See *splitter*.



value A shade of gray; tone. A low-contrast image usually exhibits a number of various values, whereas a high-contrast image has very few intermediate tones or values.

variable focal-length lens A *zoom lens*.

Variac A popular variable *transformer* for manual *ac voltage* regulation; essentially a *dimmer* that reduces voltage. A trade name.

Varicon A camera accessory used to *flash* and reduce film image *contrast*; it accomplishes the same purpose as laboratory *post-fogging* but with greater consistency and predictability. The Varicon, manufactured by Arriflex, represents a significant advance over the bulky *Lightflex*, which was the first such apparatus to find wide use. It sits in front of the lens, mounted on the rods of the camera's *matte box*, and consists of a clear glass plate encircled by eight 6 volt halogen lamps. The lamps are powered by two 12 volt *batteries* or by a 12 volt *ac/dc* power supply. The lamps emit light onto the glass flat, called the *emitter plate*, causing it to glow evenly. It brings up the light level in small enough amounts to bring up only the low-*exposure* areas of the picture, effectively flashing the film while the image is being recorded.

The Varicon method of contrast reduction has two advantages over traditional *low-contrast filters*: (1) it decreases contrast without degrading the film image and does not produce the *balation* and double images around bright areas common to such *filters*; (2) unlike the LC filter, the Varicon affects only the low-light areas of the picture.

The Varicon is also superior to traditional flashing, because it allows the camera operator to view and adjust the degree of flash desired. The effect may also be varied from shot to shot, and may be adjusted even within a single shot.

Vermeer lighting A naturalistic interior lighting, neither *high-key* nor *low-key*, but instead a continuum of modulated *values* or grays,

seen in the interior scenes painted by the Dutch painter Vermeer van Delft. In these paintings, the lighting is soft but directional, nearly always clearly justified or motivated by the light emanating from an open window, and the values are neither dark nor very bright.

video CCD A light-sensitive silicon chip or microprocessor used as the image-gathering component in a video camera. It works by rendering an image as the sum of thousands of pixels. The CCD has largely supplanted the *pickup tube* in such applications.

video target In a video camera, the face of a *CCD* or *pickup tube* where the image is focused; analogous to the *film plane* in cinematography.

visible spectrum The segment of the *electromagnetic spectrum* where visible light resides. *White light*, with wavelengths measuring 400 to 700 *nanometers*, is actually the sum of *hues* in the visible spectrum. The hues of the spectrum may be observed in a rainbow or when white light passes through a *prism*. Sir Isaac Newton identified the spectral primary hues as violet, indigo, blue, green, yellow, orange, and red. The "cool" hues (violet, indigo, blue, and green) are of short wavelength, the "warm" hues (yellow, orange, and red) comprise the longer wavelengths.

visqueen A very thin, transparent (or black) plastic sheeting, most commonly used in .006 x 20" x 100" rolls, used to cover equipment and *sets* during periods of inclement weather.

volt A measure of *electromotive force*, equal to the potential difference that will force a *current* of one *ampere* through a conductor with a resistance of one *ohm*.

voltage the standard measure of electrical potential or *electromotive force*.



walk-through A *rehearsal* of the action in a scene.

wall plate A mounting device similar to a *baby plate*, but which instead accommodates a *juntor spud*.

wall sled A mounting device designed to support lighting equipment from a *set* wall without the necessity of nailing directly into the wall. The weight of the fixture exerts pressure to force the sled against the wall. The weight of the entire unit is supported by a chain of rope that is secured to the top of the set. The baby wall sled is equipped with dual 5/8" pins. The first pin holds a lighting fixture, and the second pin may be used for holding a *grip arm* or head. The *juntor* and *senior* wall sleds are different in size, although both of them have 1-1/8" receptacles. See figure W.1 (page 164).

wall spreaders Extension devices used to suspend *grip* and lighting equipment between two walls. Wall spreaders work by inserting a pre-cut 2" x 4" or 2" x 6" stud into the mounts, then wedging the complete unit from wall to wall. Although supporting pressure may be extended by a screw device, caution must be exercised not to apply too much pressure. Wall spreaders should be positioned so that they press on the portions of the wall reinforced by internal studs.

warm hue One of the colors of relatively long wavelength. These include red, orange, and yellow and their intermediate *hues*. These colors are perceived to be warm in appearance, as opposed to *cool hues* such as green, blue, and violet.

waste, to (verb) To gradually swivel a fixture to take down the *intensity* of *illumination* on a subject.

watt A unit of electrical power equal to the amount of work of one *ampere* under the pressure of one *volt*.



Figure W.1 Wall sled (baby). Courtesy of Matthews Studio Equipment, Inc.

waveform monitor An oscilloscope that displays the video signal generated by a camera. The screen is essentially a graph plotting the video signal amplitude (image brightness) against time (image position from left to right). The vertical axis of the monitor display is divided into 100 *IRE units* (named for the Institute of Radio Engineers). Twenty IRE units equal one *stop* of camera *exposure*. The waveform monitor will display the signal for one line of the picture or a composite of the signals for every line in the frame.

Zero on the scale, or absolute black, represents the blanking level, which can be seen as the black bar that rolls on a monitor screen when the vertical hold is out of adjustment. Reference black, the darkest possible *value* within the picture, should be set at 7.5 IRE units; this is called the *setup* level or *pedestal*. This represents the darkest value a picture can have, but this does not mean every picture must contain picture elements of this value. Any signal that exceeds 100 IRE will appear as white in the picture. The portion of the video signal that normally measures -40 IRE is the sync pulse, which regulates the scanning and field rate, and the portion in the -20 to +20 IRE range outside the picture is the color burst, which carries the *chrominance* (color) information.

The waveform monitor serves as a combination *light meter* and *contrast* indicator. The pattern of green smears on the monitor screen, which falls between 7.5 and 100 IRE, illustrates the brightness range of any given scene. The highest peak of the green trace

represents the brightest *highlight*, whereas the lowest valley denotes the darkest shadow. The range covered reveals the contrast levels within a frame and the degree of *latitude* that is available. If highlights are pressed up at 100 IRE so that the mountains have their peaks chopped off, the result is called *clipping*, which results in burned-out whites with little detail. This is analogous to *overexposure* in film.

wedge A small tapered block of wood used for leveling *dolly tracks* and other jobs. Standard wedges measure 10" x 4" x 1/16" tapering to 1" thick.

Western dolly A bigger version of the *doorway dolly*, the Western dolly has large wheels that provide a smoother, steadier ride than the smaller dollies. The Western dolly can also be fitted with flotation track wheels and (unlike the doorway dolly) can be operated on curved track.

The push bar can be tilted down 34 degrees by use of the tilt adapter for operator convenience. The bar can also be side-mounted for close shots. When inverted, the dolly's platform clearance is raised for use over rough terrain.

The Western dolly can accommodate a turret assembly, allowing for the mounting of two seats and a complete camera configuration supported by a *Mitchell base*. Pop-off wheels allow quick removal for easy storage. Axles are captivated into the wheel assemblies to prevent the axle from becoming separated from the wheel upon removal.

whip A section of *feeder cable* split off the main line and to a secondary location. Unlike a Siamese main feeder line, the whip often consists of one hot *leg* and a neutral.

white balance A function of special video camera circuitry that automatically adjusts for differences in *color temperature*, ensuring that all colors will be represented faithfully. White balance is achieved by positioning a white or neutral *gray card* before the camera lens and activating the white balance control; the camera then adjusts for the proper balance.

white card (1) A large piece of white cardboard appropriately positioned to reflect light onto a subject or scene. (2) The white side of a standard *gray card*, having a *reflectance* of 90 percent. In very dim lighting conditions, the white card may be used instead of the gray card in order to take exposure readings with a *reflected light meter*; the recommended *f-stop* must then be opened up an additional 2-1/2 stops for accurate *exposure*.

white flame carbons Carbon rods in a *carbon arc* lamp that are balanced for *daylight*. White flame carbon arc light is high in *ultraviolet* radiation, thus a special Y-1 *filter* is used to block the UV light.

white level gamma The *gamma* of the video signal, applied to *highlight values*, controlled by adjusting white level or by *gamma compression*.

white light Light that includes all colors of the spectrum in more or less equal amounts; *daylight*.

wide-angle lens Any lens of relatively short *focal length* that gives a wide angle of view. Wide-angle lenses in 35mm filmmaking include any lens with a focal length of 35mm or less (in 16mm film and video, any focal length less than 16mm may be considered wide-angle).

wild wall An easily removable section of a *set*, to facilitate camera positioning and lighting.

wind machine A large fan for producing gale effects. See figure W.2.

wing To move a *gobo* such as a *flag* toward or away from a source in an *arc*.

wood clamp, #1 A common *clothespin*. See also C-47.

wrap The end of a shoot when all equipment is put away and crew and cast quit for the day.

Wratten series The trade name of a series of camera lens *filters*.



Figure W.2 Wind machine. Courtesy of the Mole Richardson Company.



xenon A *discharge-type enclosed arc lamp* similar to an *HMI*. The xenon lamp utilizes a polished parabolic *reflector* that focuses a beam into a concentrated column, with a spot throw exceeding several blocks. The xenon boasts the highest *lumens per watt* output of any artificial source available (at a relatively narrow beam spread). They are available in 1K, 2K, 4K, and 7K sizes, as well as a 75 watt size for *sun gun* use. The 1K and 2K models may be plugged into a wall socket or small *generator*. The high-watt units are powerful enough to crack glass windows with the *intensity* of their beam.

The 75 watt model makes an excellent choice for flashlight effects, since they feature the same intense coherent beam of their bigger siblings.

Unlike HMIs, xenon lamps do not shift in *color temperature* as they age or as *voltage* drops or surges.

Xenons have disadvantages as well as attributes. The instruments are costly to rent. They require a noisy fan system that causes problems with sound filming. The relative position of the *globe* to the reflector causes an optical "*donut*" effect in the center of the beam, which cannot be entirely eliminated. The parabolic design that concentrates the beam makes it difficult to safely place *flags*, *nets*, or *gels* anywhere near the light. Because of the intense focus of the beam, even *gobos* placed away from the light may melt or burn (it is actually safer to place the gel on the face of the lamp rather than farther down the light beam).



yellow One of the *subtractive primary* colors, a mixture of red and green. Yellow is formed by subtracting blue from the *visible spectrum*.

yellow flame carbons Carbon rods in a *carbon arc lamp* that are balanced for *tungsten*.

yoke The forked piece upon which a lighting instrument or *reflector board* pivots.

Y-1 filter A pale yellow *filter* that is commonly used with *white flame carbons* in *carbon arc lamps* to filter out *UV* radiation. Its *transmission* is rated at 90 percent.



zinger Any directional light source used to add snap to a scene lit predominantly by soft light.

zip light A narrow 8" x 17-1/2" *softlight* with a 2,000 *watt lamp* manufactured by the *Mole Richardson Company*, frequently used in low-ceiling situations to provide a soft *backlight* over the actors. See figure Z.1 (page 170).

zone See *zone system*.

zone system A system of *exposure* devised by photographer Ansel Adams. The zone system divides the continuous *gray scale* into eleven logarithmic steps or *zones*, which proceed in twos; that is, each succeeding step is greater than the preceding one by a multiple of two. This correlates to the procession of *f-stops* in camera lenses and *light meters*. Eighteen percent *reflectance* gray, the value of standard *gray cards*, is zone 5, Caucasian skin tones are generally zone 6, and dark complexions are often zone 4.

zoom (verb) To change the *focal length* of a *variable focal-length lens*. Zooming is usually a smooth movement and is sometimes used within a shot in lieu of *dollying*.

zoom lens A lens that has the ability to change *focal lengths* when a ring on the lens barrel is turned. Depending on its ratio of widest to longest focal length positions, the lens may be used to frame a wide variety of shot sizes, from wide to extreme *close-up*.

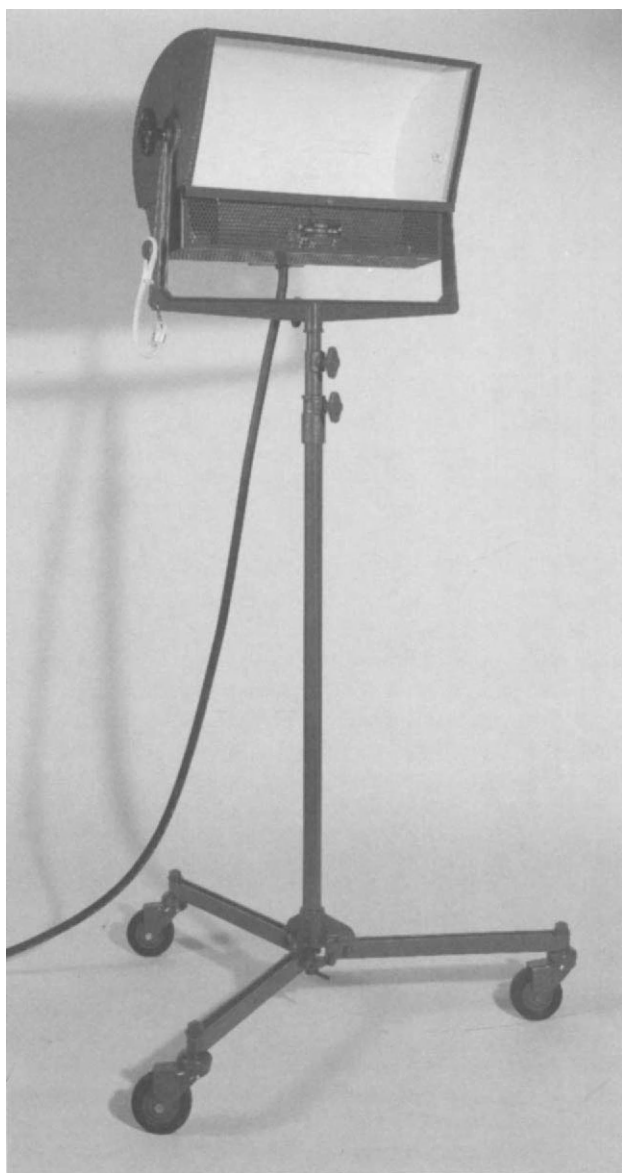


Figure Z.1 Zip light. Courtesy of the Mole Richardson Company.